



NASA SP-7501

THE SYSTEMS APPROACH TO MANAGEMENT

AN ANNOTATED BIBLIOGRAPHY

—WITH INDEXES—

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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INTRODUCTION

In 1967 the National Aeronautics and Space Administration, through its Office of Policy, awarded a grant to the Boston University College of Business Administration to develop a bibliography on the systems approach to management. This work grew out of the interest of Harold A. Wolff, a management consultant and adjunct member of the Boston University faculty, who, in cooperation with other faculty members, had developed a graduate seminar designed to evaluate space-age management and decision-making techniques and their applicability outside the aerospace industry.

Under Mr. Wolff's guidance, a compilation of existing literature was prepared on the systems approach and its impact across a broad spectrum of business and government activity. This original bibliography has been reorganized and indexed by the Technical Information Service of the American Institute of Aeronautics and Astronautics under the supervision of Miss Irene Bogolubsky, Associate Director. Items are grouped under nine subject categories with appropriate scope notes. Each item is followed by a brief descriptive annotation, and both subject and author indexes are provided.

It is hoped that the bibliography will be of value to the scholar and student interested in the increasingly important concepts of systems analysis and systems management. In addition, it should serve as a reference source to managers actively concerned with important trends in the concepts of management and decision-making.

NASA SP-7501 is published by the Scientific and Technical Information Division of the NASA Office of Technology Utilization as part of a continuing program to provide management, and those interested in management, with convenient information tools.



Charles F. Bingman

Availability of Documents Covered by this Bibliography

None of the documents covered by this bibliography is available from NASA. Interested persons should address their inquiries to the source that appears in the citation at the head of each announcement.

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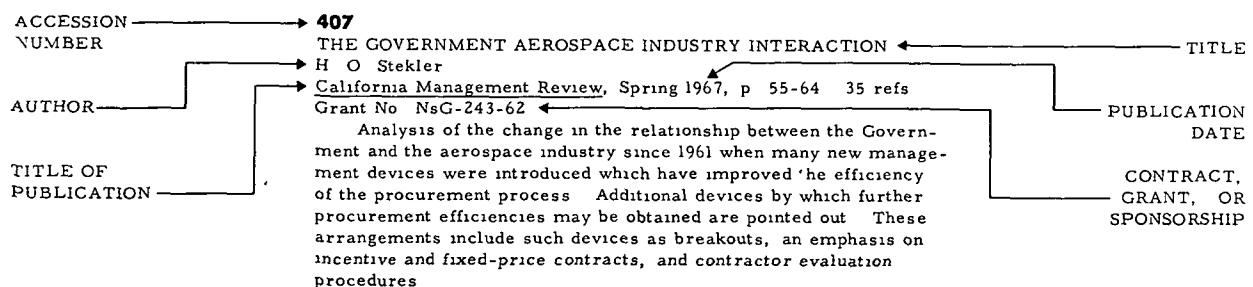
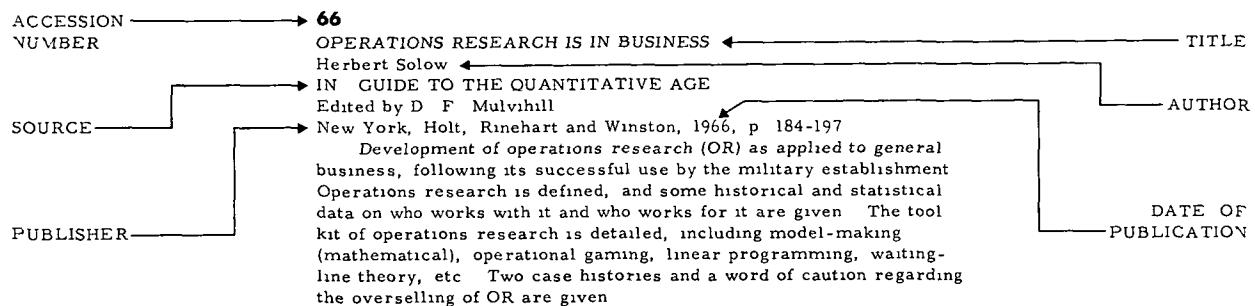
Subject Categories

Announcements in the bibliography appear in accession number order and are grouped under the following categories

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S1 THE SYSTEMS CONCEPT Includes systems approach, systems analysis (incorporating program planning), systems design, systems engineering and implementation, systems management, relation to other concepts	1
S2 RECENT DEVELOPMENTS Includes recent trends in the development of management, historical perspective on the development of the systems concept, impact of the defense and space efforts on management	14
S3 SPECIFIC FUNCTIONS Includes the impact of the systems concept on specific functions (sub-systems) of organizations, physical distribution, marketing, production, research and development, management information, other functions (packaging, materials handling, exploration, etc.)	14
S4 MULTI-NATIONAL ORGANIZATION Includes the relationship between the systems concept and the management of the multi-national organization	32
S5 PUBLIC ADMINISTRATION Includes the systems concept in public administration (i.e., not-for-profit organization), federal, state, and local government, non-profit organizations (e.g., hospitals, universities), public problems and programs (health, air pollution, military, space, oceanography), political, social, and economic development	33
S6 MANPOWER MANAGEMENT Includes the systems concept in manpower management (as related to development and utilization)	42
S7 IMPACT ON MANAGEMENT Includes the impact of the systems approach on management in general, decision making, organizational (top management structure, integration and balance between headquarters and field organization), planning, measurement, and control techniques	45
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TYPICAL CITATIONS AND ANNOTATIONS





the systems approach

MANAGEMENT

JULY 1969

S1 THE SYSTEMS CONCEPT

1 PROGRESS IN OPERATIONS RESEARCH VOLUME 1

Edited by R. L. Ackoff
New York, John Wiley and Sons, Inc. (Publications in Operations Research, No. 5), 1961 514 p

This volume emphasizes the area of technical progress - in the development of modeling techniques and ways of using these techniques to solve problems. Inventory theory, replacement theory, linear and dynamic programming, queuing theory, sequencing theory, simulation, and gaming are included for practicing operations researchers.

realizes the strong formal similarity between utility theory in economics and field theory in physics is in a better position to learn from the physicists

5

CAPITALISM IN COMMUNIST CHINA Trans-Action, June 1967, p. 4

Discussion of Communist China's industrial management system and managing methods, with emphasis on how they differ from their counterparts in the U.S. and the USSR.

2

OBSERVER THE AMERICAN PAPERS

Russell Baker

New York Times, Apr. 13, 1967, editorial page

Satire on late twentieth-century man's behavior and beliefs in a world of computers, machines, punch cards, dossiers - in other words, in a completely dehumanized system

3

READINGS AND NOTES ON OPERATIONS MANAGEMENT THE CONDUCT OF LARGE-SCALE PRODUCTIVE ACTIVITY IN AN ADVANCED INDUSTRIAL SOCIETY

Robert H. Bock, Harry F. Everts, and Kenneth H. Myers
Evanston, Ill., Northwestern University, School of Business, 1961
502 p

This collection is intended for use in a basic course in that field of business study which is concerned with the manner in which firms go about making or producing (rather than marketing) the goods and services that constitute the essence of their respective activities. The authors have been mindful of the wide variety of probable career paths and have sought to meet the needs of students in assembling these materials. Emphasis is placed on understanding the basic character of industrialization as a dynamic process. The study program is presented in a manner in which the subject of organization is related to its basic determinants - the technological base, the character of the markets, industry structure and practice and managerial philosophy. Practices and problems of human resource management are shown as consequences of the technology of the basic productive process and the organizational structure used.

4

GENERAL SYSTEMS THEORY - THE SKELETON OF SCIENCE

Kenneth E. Boulding
Management Science, vol. 2, Apr. 1956, p. 197-208

Discussion of general systems theory, a level of theoretical model-building between the highly generalized constructions of pure mathematics and the specific theories of the specialized disciplines. One of the main objectives of general systems theory is to develop a framework of general theory to enable one specialist to catch relevant communications from others. Thus the economist who

6

FORMAL ORGANIZATION A SYSTEMS APPROACH

Rocco Carzo, Jr. and John N. Yanouzas
Homewood, Ill., Richard D. Irwin, Inc., Dorsey Press, 1967
591 p

The book applies the systems approach to formal organization. Formal organization is treated as a set of interdependent elements which act to achieve certain goals and to maintain an orderly state of affairs in exchanges with the environment. Organizational behavior is classified into technical, social, and power subsystems. The method of designing an organization is to harness the tendency toward order and arrange resources in a way to permit maximum achievement goals.

7

SYSTEMS PHILOSOPHY

David O. Ellis and Fred J. Ludwig
Englewood Cliffs, N.J., Prentice-Hall, Inc. (Space Technology Series), 1962 395 p

The book discusses the major key points and probable trends in systems technology, to make them intelligible to both management and the public and to provide a general survey of the subject for the scientific generalists and specialists evolving the technology. Appendices provide supportive material for the text, illustrating the variety of representations employed in systems engineering.

8

MAKING TECHNOLOGY A UNIVERSALLY AVAILABLE TOOL

Walter W. Finke
Space Digest, vol. 10, Jan. 1967, p. 49-51

Proposal that technology be made a universally available tool. To achieve this technologists and scientists must enter the real world of policy to offer their ideas for the intelligent use of technology to improve existing world problems.

9

PSYCHOLOGICAL PRINCIPLES IN SYSTEM DEVELOPMENT

Edited by R. M. Gagné
New York, Holt Rinehart and Winston, Inc., 1962 560 p

S1 THE SYSTEMS CONCEPT

This book is a collection of 14 reviews of various aspects of the field of the integrated psychotechnology of system development. Formerly referred to as human factors engineering, various procedures, and the psychological principles on which they are based, in the study, planning, design, development, and testing of complex man-machine systems are discussed. Emphasis is on the task analysis, training, and evaluation stages of the development of the human component.

10

AUTOMATION IN BUSINESS AND INDUSTRY

Edited by E. M. Grabbe
New York, John Wiley and Sons, Inc., 1957, 611 p.

This book is based on a series of lectures given at the University of California on automation in business and industry. It is noted that feedback control theory, instrumentation, and analog and digital computation are becoming integrated as automation is applied on a broad scale to control systems encompassing the range from top management to individual machines. Electronics, computers, and data processing are emphasized.

11

THEORY OF SELF-ADAPTIVE CONTROL SYSTEMS, INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL, SYMPOSIUM, 2ND, NATIONAL PHYSICAL LABORATORY, TEDDINGTON, ENGLAND, SEPTEMBER 14-17, 1965, PROCEEDINGS

Edited by P. H. Hammond
New York, Plenum Press, 1966, 370 p.

The book presents a collection of 37 papers covering a wide field of research activities concerned with the analysis and synthesis of self-adaptive, optimal, and multilevel control systems.

12

FROM THE THOUGHTFUL BUSINESSMAN

Allan Harvey
Harvard Business Review, vol. 41, May-June 1963, p. 42, 46

Compelling analysis of the need for management to approach problems and solutions in terms of systems concepts. The systems approach allows management of an operating system to consider the nature and the direction of the change with which it must deal.

13

MANAGEMENT, ENGINEERING, AND ARCHITECTURE - THEIR CHANGING ROLES IN THE AGE OF AUTOMATION

Allan Harvey
American Society of Mechanical Engineers, Annual Meeting, New York, N.Y., Dec. 1-6, 1957, Paper 57-A-251 8 p. 10 refs

Discussion of the role of engineering in a rapidly changing technology. It is found important that engineers analyze what it is that is new about automation because it involves a new relationship between management and the engineering function and between engineering and other professional functions.

14

A CRITIQUE ON THE APPLICATION OF SYSTEMS ANALYSIS TO SOCIAL PROBLEMS

Ida R. Hoos
California, University, Space Sciences Laboratory, Social Sciences Project, Internal Working Paper No. 61, May 1967 28 p. 10 refs
Grant No. NSG-243-62

Systems analysis and its applicability to social problems. To apply technical rationality to situations in which the crucial variants are social and political, systems engineering will require great modification and refinement before much stock can be put in its public problem-solving propensities. Operations research, cost/benefit, systems analysis, and program budgeting form the intellectual technology which could possibly improve public decision-making.

15

THE THEORY AND MANAGEMENT OF SYSTEMS (2nd Edition)

Richard A. Johnson, Fremont E. Kast, and James E. Rosenzweig

New York, McGraw-Hill Book Co., Inc., 1967, 350 p.

An operative theory of management based on the systems concept is the basis of this book. The functions of planning, organizing, controlling, and communicating are used in developing the philosophy of management by system. Various systems concepts are applied to particular examples, such as automation and data processing. The design and implementation of systems covers management science, network analysis, mathematical programming, simulation, and the effects of changes on the human factor. The evolution of systems management and its future role are noted.

16

OPEN SYSTEM THEORY

IN THE SOCIAL PSYCHOLOGY OF ORGANIZATIONS

Daniel Katz and Robert L. Kahn

New York, John Wiley and Sons, Inc., 1966, p. 8-13

Proposal of a resolution of difficulties in the social psychology of organizations through the application of open-system theory. Through the basic assumption of entropy, the necessary dependence of any organization upon its environment is emphasized. The open-system concepts of energetic input and maintenance point to the motives and behavior of individuals who are the carriers of energetic input for human organizations. The concept of output and its necessary absorption by the larger environment also links the micro- and macro-levels of discourse. This theoretical approach is not yet fully developed, but is exemplified by several important lines of work.

17

THE CONCEPT OF SYSTEM

Alfred McClung Lee

Social Research, vol. 32, no. 3, Autumn 1965, p. 229-238 10 refs

The concept of system as it is reflected in human behavior and social arrangements. The fallacy of social myth of social system is paid special attention. This myth is related to the deep-set human readiness to anthropomorphize society and societal entities, to give great attention to the presumed personification of governments in the decision-making characteristics of a president, etc. The myth makes society appear to work as a system, and its so-called "dysfunctions" further strengthen the illusion. Society is not a linkage of individual atoms but a composite of interrelated social aggregates and arrangements variously perceived and conceived in societal and group cultures and in terms of individual perceptives.

18

SYSTEMS THEORY AN INTEGRATING VIEW OF THE MANAGERIAL ROLE

Justin G. Longenecker

IN PRINCIPLES OF MANAGEMENT AND ORGANIZATIONAL BEHAVIOR

Columbus, Ohio, Charles E. Merrill Books, 1964, p. 517-533 21 refs

Integrated picture of the manager and his activities, provided by the adaptation of the systems concept to functions of management. This approach stresses the interrelatedness of all parts and functions of a business organization. It determines the basic functions, decisions, and relationships necessary in accomplishing the system's objectives and tailors the organization structure to these requirements.

19

LIVING SYSTEMS BASIC CONCEPTS

James G. Miller

Behavioral Science, vol. 10, July 1965, p. 193-231 118 refs

Presentation of the general systems behavior theory, which is concerned with a special subset of all systems, the living ones.

S1 THE SYSTEMS CONCEPT

General systems theory consists of a set of related definitions, assumptions, and propositions in dealing with reality as an integrated hierarchy of organizations of matter, energy, and information. Since living systems are made of matter and energy organized by information, the discussion is done in these concepts rather than in the concept of system

20

LIVING SYSTEMS STRUCTURE AND PROCESS

James G. Miller

Behavioral Science, vol. 10, Oct 1965, p. 337-379 44 refs

Consideration of the salient characteristics of a system's subsystems and components in three-dimensional space at a given moment of time. The approach used is designed to emphasize the unity of the phenomena of life, from cells to supranational systems

21

LIVING SYSTEMS CROSS-LEVEL HYPOTHESES

James G. Miller

Behavioral Science, vol. 10, Oct 1965, p. 380-411 125 refs.

Presentation of cross-level hypotheses that may be applicable to two or more levels of living systems. These hypotheses can be very powerful in generating general theory of living systems if supported by empirical evidence and so long as differences among the various levels, types, and individual cases are taken into account. The term "hypothesis" is used in the restricted sense of a proposition which can be demonstrated empirically rather than in the more general sense of any expression which is capable of being believed, doubted, or denied

22

A SYSTEMS APPROACH TO THE INNOVATION PROCESS

Jack A. Morton

Business Horizons, vol. 10, no. 2, Summer 1967, p. 27-36

Discussion of technological innovation - the cornerstone of our survival as an industrial society. It depends upon a close and timely coupling of goals and relevant research. To make this relevant innovation challenging and rewarding and self-motivating for the individual, the management may find the solution in systems engineering since technological innovation is not a single function or a random act. It is a total process with specialized but connected parts all responding in some coordinated way to overall system goals

23

THE OPERATIONS RESEARCH GAP

Francis J. O'Reilly

Systems and Procedures Journal, Jan.-Feb 1967, p. 28-32

Investigation into the causes of the gap between theory and practice in operations research (OR). In the early 1950s, OR swept the business world and produced startling economies. Then, as obvious problem areas dissolved, the return on investment in OR began to diminish and, finally, its use discontinued. The reason for this is not difficult to find. Having dissolved the obvious problems, OR was given progressively more complex and obtuse problems which turned out to be unworkable for OR, presenting a gap between theory and practice in OR. The aim of this article is to illustrate this gap by the critical path method and to find what can be done to increase the number of workable solutions

24

OUR DYNAMESH ECONOMY

Chicago Tribune, Aug 16, 1965, p. 20.

Characterization of the national economy as a dynamesh economy, meaning "it meshes together all the productive and creative sectors of our economy - business, labor, the professions, agriculture, and government - in a dynamic balance of forces."

Considering, however, a few factors one finds it remarkable not that the machine has worked so well, but that it has worked at all

25

THE WORLD OF SYSTEMS

Brian Rothery

Data Processing Magazine, Apr 1967, p. 78, 79

General investigation of systems management. The qualifications and training of systems personnel and their role in the future are defined.

26

THE PARABLE OF THE SPINDLE

Elias H. Porter

Harvard Business Review, vol. 40, May-June 1962, p. 58-66

New approach to organizational problems through systems theory. Once the president of a large chain of short-order restaurants hired a sociologist, a psychologist, and an anthropologist to find out the causes of an organization problem at times of overload in his business and to suggest ways to correct it. Although the scientists could not agree on what caused the organization problem, they could find a correcting device by using systems theory

27

NEW DIRECTIONS IN INDUSTRIAL DYNAMICS

Edward B. Roberts

Industrial Management Review, vol. 6, no. 1, Fall 1964, p. 5-14 54 refs

Industrial dynamics - the study of top management problems from a feedback systems point of view. Its potential value to managers is certain, but a thoughtful management will have to start with a modest effort and a long-range view and deep examination of managerial feedback systems

28

STATEMENT BEFORE THE SPECIAL SUBCOMMITTEE ON SCIENTIFIC MANPOWER UTILIZATION OF THE SENATE COMMITTEE ON LABOR AND PUBLIC WELFARE, JANUARY 27, 1967

Henry Rowen

Washington, D.C., 1967 11 p

Discussion, in general terms, of the use of the systems approach and systems analysis in solving public problems and planning public policy. There are several ways of making discoveries about objectives, values, relationships or facts. Clear thinking about criteria is one way. Another is to identify as many important factors and relationships among factors as possible. A third way is to develop and assess alternatives for decision-making. Industry and the universities are mentioned as two good sources of participants for various government-level systems analyses

29

IS THE TOTAL SYSTEM CONCEPT PRACTICAL?

A. T. Spaulding, Jr

Systems and Procedures Journal, Jan.-Feb 1964, p. 28-32 5 refs

Discussion of the practicality of a total system approach, from the viewpoint of management's two basic problems, communication and information. The total system concept is practical for solving these problems at the lowest possible cost and permits elimination of redundant files and duplications of clerical efforts, thereby minimizing the possibility of errors. It also permits daily updating of records and files, better cost control and management of resources, and relieves management and supervisory personnel of routine decision-making through the use of computer logic

S1 THE SYSTEMS CONCEPT

30

THE MANAGER'S JOB A SYS1. APPROACH

Seymour Tilles.

Harvard Business Review, vol 41, Jan -Feb 1963, p 73-81
7 refs

Division of the manager's job, from a systems point of view, into four basic tasks. They are defining the company as a system, establishing system objectives, creating formal subsystems, and systemic integration. Recently whole new fields of critical importance to management have emerged: cybernetics, data processing, systems engineering, etc. The impact of these new ideas has brought forth the real challenge to each manager to define his job in terms of the atomic age, and this is what the systems approach to management promises to do.

31

SYSTEMS - A WAY OF MANAGEMENT LIFE FOR THE FUTURE

Norwood A. Warner

Chicago Association of Commerce and Industry and American Statistical Association, Meeting, Chicago, Ill., Apr 1, 1966, Paper 10 p

Discussion of systems, a way of management life for the future. For managers, one of the most promising ways to maintain a competitive position is to learn about and apply the "systems" approach to business on a continuing basis.

32

TOTAL SYSTEMS CHARACTERISTICS AND IMPLEMENTATION

Charles Clifford Wendler

Cleveland, Systems and Procedures Association, 1966 123 p

This book deals with using computers in applying the total systems concept to a total integration of work. Many initial uses of computers for business problems were direct conversions of existing procedures. The ultimate goal in the total systems effort is to interlock all major systems in a company. The need for timely and accurate management information is intensified by the growth and diversification of businesses. Operating systems provide actual performance information to prepare management reports employing the exception principle. Profit planning is an integral part of the total system.

33

SELECTED PAPERS OF NORBERT WIENER

Norbert Wiener

Cambridge, Mass., M I T Press, Society for Industrial and Applied Mathematics, 1964 453 p

This book is a collection of some of Norbert Wiener's outstanding mathematical and scientific contributions. Nets and the Dirichlet problem, differential space, generalized harmonic analysis, Tauberian theorems, entropy and information, and other topics of importance to linear and nonlinear theory in engineering are treated.

34

DATA COLLECTION AND SYSTEMS ANALYSIS

R C Amara

Science, vol 152, Apr 22, 1966, p 450

Discussion of the relation between data collection and systems analysis in making decisions and solving problems on resource allocation in uncertain situations. It is pointed out that massive data collection and data processing are not valid systems analyses of a problem, but rather, are integral parts of the systems analysis process.

35

THE FEDERAL BUDGET AS AN INSTRUMENT FOR ANALYSIS, PLANNING, AND MANAGEMENT

Melvin Anshen

RAND Corp., Memorandum RM-4512-RC, Apr 1965 30 p

Proposal that the Federal budget be used as an instrument for planning, analysis, and management. It is suggested that the program budget concept, which was installed in the Department of Defense in 1961, be applied to the nondefense parts of the budget. The main points discussed are the issues in determining program goals and making resource allocation decisions. One objective of the proposal is to facilitate economic analysis, forecasting, and planning in the private sector. Problems in the current budget and budget structure and two major problems in a program budget are discussed.

c

36

PLANNING ASPECTS AND APPLICATIONS

Melville C. Branch

New York, John Wiley and Sons, Inc., 1966 333 p

This book studies the state of the art of planning as applied to project, city, corporate, and military planning. Some of the aspects covered are land use and law, mathematical simulation, and psychological factors. The planning process is traced for all four types of planning.

37

PLANNING CONSIDERATIONS IN DEVELOPING MANAGEMENT SYSTEMS

Detroit, Burroughs Corp (Management Science Series), n.d. 35 p 80 refs

Consideration of the planning and implementation of a management system, on top of an existing data processing system, for information and decision purposes combined. Two common, frequently occurring problems in this transition are the fulfillment of management requirements by the data processing system design and the involvement of all levels of management in the system. Thorough systems planning, analysis, and design should solve the former problem. The latter problem could be solved by asking management what information they would like from a management system, using the so-called top-down approach, or, alternatively, by selling management a system after performing a systems study to determine the requirements and structure of an appropriate management system.

38

MAN-MACHINE COOPERATION ON PLANNING AND CONTROL PROBLEMS

Donald C. Carroll

International Management Review, Fall 1966, p 47-54 26 refs

Investigation of the future possibilities for man-machine systems in solving planning and control problems. On-line, real time, and time-sharing computers are discussed, and their computational power and ability to handle complex situations are noted. The advantages of the superior heuristic, pattern recognition, and subjective judgment abilities of a man in a man-computer system are mentioned. One interesting development is the closely coupled man-machine system, and another is team planning. The solution of global problems and operations planning and control are also discussed.

39

NETWORK MODELS FOR PROJECT SCHEDULING

Børge M. Christensen

Machine Design, May 10, p 114-118, May 24, p 173-177, June 7, p 132-138, June 21, p 155-160, July 5, p 105-111, July 19, 1962, p 136-140 16 refs

S1 THE SYSTEMS CONCEPT

Presentation of a series of articles to describe network models for project scheduling by using the critical path method (CPM). The building blocks of project-network methods are presented. The preparation of network models for a realistic engineering-development project is discussed, and it is shown how to prepare computer routines to formulate the entire project-network procedure in exact mathematical terms. Choosing a plan, based on computerized resource allocation, is dealt with.

40

DEFENSE MANAGEMENT

Edited by Stephen Enke

Englewood Cliffs, N.J., Prentice-Hall, Inc., 1967, 385 p.

This book on defense management has three sections covering Pentagon decision-making, cost effectiveness applications, and special defense problems. The resource allocation process is covered extensively. Research and development, balance of payments, defense expenditure effects on the domestic economy and military-assistance programs are also treated.

41

WHAT IS RESOURCE ANALYSIS?

G H Fisher

RAND Corp., Seminar on Resource Analysis, Santa Monica, Calif., Jan. 1963, Paper 14 p.

Discussion of resource analysis, covering its definition, generalities, and applications. The three classifications related to the context of a particular problem are (1) time horizon, (2) decision context, and (3) scope of the problem. The analysis of these three classifications is expanded, and the impact of context on the concepts, methods, and techniques used in resource analysis is investigated in detail. The context of long-range military planning is discussed, noting end product orientation, life-cycle identification, support activities, etc.

42

ANATOMY OF CORPORATE PLANNING

Frank F Gilmore and Richard G Brandenburg

Harvard Business Review, vol. 40, Nov.-Dec. 1962, p. 61-69

5 refs

Framework for exploring top-management planning in corporations. The master plan consists of three phases - formulating the economic mission, determining the competitive strategy, and specifying a program of action - plus a reappraisal component, which is given consideration first in any planning. This particular framework is well suited to the problem of achieving the most beneficial combination of actions which will produce synergistic effects. The planning process has also been subdivided into different product-market arrangements, in addition to the key decision areas given above.

43

COMPUTER APPLICATIONS TO PROBLEMS OF TRANSPORTATION AND DISTRIBUTION MANAGEMENT - SYSTEMS ANALYSTS AND SYSTEMS ANALYSIS

Nicholas A. Glaskowsky, Jr.

Transportation and Distribution Management, July 1966, p. 45, 46

Study of systems analysis and the application of computers to the solution of complex transportation and distribution management problems. Systems analysis is defined as the creation of an orderly arrangement of interdependent activities and related procedures which implements and facilitates the performance of a major activity of an organization. It is suggested that the best source for systems analysts is likely to be internal, and any bright, young middle manager is probably capable of the job.

44

NOTES OF A PRACTITIONER

William Gorham

Public Interest, no. 8, Summer 1967, p. 4-8

Examination of the role of the planning, programming, and budgeting system in the decision-making processes in Federal agencies. The problem of determining benefits in a cost-benefit analysis is plagued by a lack of data, the problem of benefit measurement, and the problem of comparing benefits. However, where programs have the same objectives, cost effectiveness is applicable. Although primitive tools of analysis are limiting, it is possible to identify successful methods of reaching an objective and to improve and upgrade programs.

45

SYSTEMS ANALYSIS A DIAGNOSTIC APPROACH

Van Court Hare, Jr.

New York, Harcourt, Brace and World, Inc., 1967, 544 p.

Systems analysis from the viewpoint of pattern formulation and the diagnosis of systems operations is discussed in this book. The major divisions considered are systems definition, which includes block diagrams, flow graphs, classifications, hierarchies, and memories, plus some simplification methods, systems analysis and diagnosis, wherein are noted selected procedures, search methods, and simulation, and, finally, systems treatment, which includes systems improvement and the implementation of systems changes. Matrices, mathematical transformations, coding principles, and, briefly, information measures are discussed in appendices.

46

"OPERATIONS RESEARCH" OR MANAGEMENT

Cyril C Herrmann and John F Magee

Harvard Business Review, vol. 41, July-Aug. 1963, p. 100-112

Application of a scientific method to business problems. The operations research concept in management provides a basis for arriving at an integrated and objective analysis of operating problems. The four concepts of fundamental importance to the practice of operations research are the model, the measure of effectiveness, decision-making, and experimentation (either for information or to test the validity of conclusions). In establishing operations research in an industry, one must choose the initial area for investigation, select the personnel, and develop organizational plans for future growth. It is noted that operations research is limited to the study of tangible, measurable factors. Case histories are provided.

47

AN APPRECIATION OF SYSTEMS ANALYSIS

Charles Hitch

Operations Research Society of America, Meeting, Los Angeles, Calif., Aug. 15, 1955, Paper 25 p.

Application of systems analysis to military problems. Systems analysis is defined, and the essential elements - objectives, costs, mathematical models, and selection criterion - are outlined. Military systems analysis is discussed through six variables - (1) analysis as a tool for operations decisions, (2) increase in inter-dependent factors, (3) uncertainty problems, (4) enemy reactions, (5) time-phasing, and (6) objectives and criteria. The advantages of systems vs unsystems and analysis vs intuition are analyzed.

48

AN INTRODUCTION TO SYSTEMS ANALYSIS

Malcolm W. Hoag

RAND Corp., Research Memorandum RM-1678, Apr. 18, 1956

22 p.

Introduction to systems analysis. The paper is an attempt to discuss systems analysis in a broad context, from a conceptual point

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of view, and is written in connection with military systems problems. Various comparisons are made to illustrate the problems, and charts are presented. It is pointed out that systems analysis is a useful tool and can be applied for a better understanding of a complicated problem.

49

HOW TO CONDUCT AN EDP SYSTEMS PROJECT

Leo L Kornfield

American Management Association, Conference on EDP in Hospitals Paper, n.d. 16 p

Discussion of the application of Electronic Data Processing (EDP) to hospitals. The management of a data processing study is concerned with (1) planning the project, (2) organizing and staffing a study team, (3) developing a solution in principle, (4) securing top administrative approval, and (5) designing a system in detail. The manufacturer's responsibilities are (1) marketing, (2) technical support personnel, (3) education, and (4) programming systems and aids.

50

DECISION MAKING, INFORMATION SYSTEMS, AND THE ROLE OF THE SYSTEMS ANALYST

Oleh Kostetsky

Management Science, vol 13, Oct 1966, p C-17 to C-20

Consideration of the roles of the systems analyst and the operations research analyst in designing a management information and/or data processing system for a decision-maker. The information system should, in proper fashion, process raw data and derive information which will be perceived as an increase in knowledge by the decision-maker. In order to ensure that his decisions are translated into acts causing desired effects, the system should also provide information in which he can perceive that his decisions were translated into acts, and with which he can measure and analyze the effects of those acts. The input data problem is noted.

51

COMMENTS TO THE SPECIAL SUBCOMMITTEE ON THE UTILIZATION OF SCIENTIFIC MANPOWER OF THE COMMITTEE ON LABOR AND PUBLIC WELFARE (SENATOR GAYLORD NELSON, CHAIRMAN)

Robert W Krueger

Washington, D C , Apr 7, 1967 23 p.

Proposals on the development of systems analysis submitted to the Special Subcommittee on Scientific Manpower Utilization. A history of systems analysis and the types of firms which use it are given. The availability of systems analysis in the U S and the application of systems analysis to nondefense problems are discussed.

52

WHERE THE INDUSTRIES OF THE SEVENTIES WILL COME FROM

Lawrence Lessing

Fortune, Jan 1967, p 96-99, 184-192

Discussion of systems management as a possible major industry of the 1970s, alongside technical innovations. Possible applications include large, complex socio-economic problems, civilian problems, transportation, waste disposal, crime and delinquency, state welfare operations, and regional land use information systems. Already implemented are information systems for libraries, hospitals and medical science, and government and education. Centralized computer utilities with consoles even in homes are foreseen. In the area of social problems it is noted that engineers have, to date, left important human factors out of the equations too many times.

53

ADVANCED SYSTEMS ANALYSIS OF TEXTILE INDUSTRY PROBLEMS

L Fillmore McPherson, III, Alexander L Pugh, III, Edward B Roberts, and Jarrod W Wilcox
Winchester, Mass , Pugh-Roberts Associates, Inc , Final Report, Mar 1, 1966 114 p 34 refs
NBS Contract No CST-1259

Discussion of the use of systems analysis, especially industrial dynamics, in solving problems in the textile industry. The use of models and simulation is recommended, and a market orientation is preferred over an inward-directed orientation. Feedback system theories are proposed to study the industrial structure, the impact of man-made fibers, the effects of changes in demand and the labor situation, and the impact of foreign producers. Criteria for the selection of a system for study are listed. A need for innovation is noted, and possible further studies are suggested.

54

EFFICIENCY IN GOVERNMENT THROUGH SYSTEMS ANALYSIS WITH EMPHASIS ON WATER RESOURCES DEVELOPMENT

Roland N McLean

New York, John Wiley and Sons, Inc , 1958 336 p

This inquiry into the analysis of water-resource investments and civil government operations was undertaken with the hope that it would be especially useful for cost-benefit analysts, operations researchers, and government personnel engaged in evaluating alternative courses of action, and for others who are concerned about economy in government. General problems of analysis, special problems in the analysis of water-resource projects, and other potential uses of analysis to increase governmental efficiency are the major topics. Case studies illustrate specific problems.

55

AN INTRODUCTION TO SYSTEMS ANALYSIS

J K O'Keefe

Journal of Industrial Engineering, vol 15, July-Aug 1964, p 163-167 6 refs

Discussion of the technology of industrial engineering practice. Systems analysis is the analytical aspect of systems engineering. It is a systematic method of formulating and solving problems. The emphasis is on the interrelations among parts. The qualitative and quantitative aspects are discussed, noting the importance of organization. Basic considerations for formulating the conceptual model are described in terms of external requirements, sectionalization, and internal systemization. Optimization and the determination of system performance are part of the quantitative aspect. Two examples shown are the design flow chart and the system network diagram.

56

SYSTEMS ANALYSIS FOR BUSINESS MANAGEMENT.

Stanford L Optner

Englewood Cliffs, N J , Prentice-Hall, Inc., 1960 276 p.

This book analyzes business as a system of interrelated and integrated systems and subsystems. Systems analysis is a powerful descriptive and analytic tool for isolating and identifying business problems. Ten case studies are given.

57

ROYAL ORDER OF THE WHEELS' RE-INVENTORS

John M Palikan

Data Management, Jan 1967, p 18-25

Discussion of the relation of the systems analyst to business management information processing by computer. Currently developed methods and approaches for systems problems are noted.

S1 THE SYSTEMS CONCEPT

The needs of the customer are analyzed, the objectives defined, and the design project plans developed. The system development time span problem is analyzed. The use of instant data automation do-it-yourself kits for computer-based procedures is proposed as a possible solution of the problem.

58

THE FINANCIAL PORTION OF A MANAGEMENT INFORMATION SYSTEM
F S Pardee
RAND Corp, Memorandum RM-2836-PR, Dec 1961 50 p
Contract No AF 49(638)-700

Monograph on the financial portion of a management information system in connection with a USAF advanced weapon and support systems study to improve planning and programming techniques. Subjects covered include objectives, program planning and data requirements, project execution and cash control, the relationship of systems analysis and cost sensitivity analysis, and a series of financial formats for management levels.

59

ANALYSIS FOR MILITARY DECISIONS
Edited by E S Quade
Chicago, Rand McNally and Co, Amsterdam, North-Holland Publishing Co, 1964 383 p

This book is based on lectures from a RAND Corp lecture course entitled "An Appreciation of Analysis for Military Decisions." The techniques of model building are explained in detail. Technological considerations, game theory, and computers are also discussed.

60

MILITARY SYSTEMS ANALYSIS
E S. Quade
RAND Corp, Memorandum RM-3452-PR, Jan 1963 32 p 5 refs
Contract No AF 49(638)-700

Discussion of systems analysis as applied to a military problem, including costs, effectiveness and risks of various alternatives, search for relevant data, model-building, and interpretation and verification of conclusions.

61

SOME PROBLEMS ASSOCIATED WITH SYSTEMS ANALYSIS
E S Quade
Electronic Industries Association, Symposium on System Analysis in Decision Making, Washington, D C, June 23, 24, 1966, Paper 21 p 6 refs

Study of problems associated with systems analysis in decision-making under actual conditions. Problems inherent in all analyses include valid measures of effectiveness and sensible criteria for choice, the treatment of uncertainty, and the handling of nonquantifiables. Problems which analysts create for themselves include bias due to adherence to a party line, failure to devote enough time to determining the actual problem in order to formulate it correctly, and improper perspective on the role of analysis.

62

THE QUESTION CAN AIRLINES USE SYSTEMS PLANNING?
Bernard A Schriever.

Airline Management and Marketing, Jan 1967, p. 26-32

Investigation of the concept of systems planning and how airlines can use it. It is found that systems planning and management techniques can be applied to the study of air transportation over the next thirty years. The approach can be used both internally and externally by the airlines. The objective is effective utilization of

technology and human and material resources. Automation and communication are important, as is concurrent planning. The need for joint planning by various groups is stressed.

63

SYSTEMS ANALYSIS IN ORGANIZATIONAL BEHAVIOR
John A Seiler
Homewood, Ill, Richard D Irwin, Inc., Dorsey Press, 1967
219 p

A systems analysis approach to the study and solution of problems of human behavior in organizations is outlined in this book. The aim of the text is primarily to develop an analytic ability and intellectual skills, rather than social skills. The central idea of the book is that organizational behavior occurs in a system of interdependent forces, each of which is separately analyzable, and the problem is the comprehension of these forces in dynamic interplay with one another. Human, social structure, technological, and organizational inputs into the system are considered. Decision-making and action are touched on briefly.

64

THE ANALYTICAL PROBLEM APPROACH TO MARKETING
Geoffrey Shepherd
Journal of Marketing, Oct 1955, p 173-177

Summary of different approaches to the study of marketing. A new approach to marketing - the analytical problem approach - is discussed and compared in detail to the conventional institutional, functional, and commodity approaches.

65

SIX BUSINESS LESSONS FROM THE PENTAGON
Donald J Smalter and Rudy L Ruggles, Jr
Harvard Business Review, vol 44, Mar -Apr 1966, p 64-75
5 refs.

Discussion of resource allocation problems and maximum long-range effectiveness solutions in businesses in the light of military experience. Some basic concepts and techniques useful to industrial corporate planners and managers are elaborated. Included are the need for analyzing missions, integration of planning and budgeting, the application of simulation, systems analysis and operations research, sequential approach to systematic program analysis and planning, use of network diagrams in planning, implementing and monitoring complex projects, and decision-making centers.

66

OPERATIONS RESEARCH IS IN BUSINESS
Herbert Solow
IN GUIDE TO THE QUANTITATIVE AGE.

Edited by D F Mulvihill
New York, Holt, Rinehart and Winston, 1966, p 184-197

Development of operations research (OR) as applied to general business, following its successful use by the military establishment. Operations research is defined, and some historical and statistical data on who works with it and who works for it are given. The tool kit of operations research is detailed, including model-making (mathematical), operational gaming, linear programming, waiting-line theory, etc. Two case histories and a word of caution regarding the overselling of OR are given.

67

APPLYING VALUE ANALYSIS TO SYSTEMS DESIGN.

Raymond F Valentine

Management Review, Dec 1966, p 34-38.

Description of the system value analysis concept and outline of its application, in simple form, to systems design. The basic

S1 THE SYSTEMS CONCEPT

steps in this method are to determine, define, and analyze the objective of the system and identify its real purpose, determine the various costs in the system, speculate on various ways of achieving the objectives, and, finally, determine the most valuable system idea. Unnecessary costs and waste can be detected and eliminated, and other costs can be lowered. The human side of the value problem is also discussed.

68

SYSTEMS & PROCEDURES ARE YOU GETTING YOUR MONEY'S WORTH?

Raymond F. Valentine

Supervisory Management, Feb 1967, p. 4-8

Application of the system value analysis concept to systems and procedures. The basic steps in this technique are to determine, define, and analyze the objective of the system, identify its real purpose, determine the various costs in the system, speculate on various ways of achieving the objectives, and, finally, determine the most valuable system idea. Unnecessary costs and waste can be detected and eliminated, and other costs can be lowered. The reasons for paperwork piling up are discussed.

69

SYSTEMS AND BUSINESS OPERATIONS ANALYSIS - STUDY METHODS AND BREAKTHRU TECHNIQUES

N. A. Warner

Chicago Ill., American Telephone and Telegraph Co., 1966 36 p

Study methods and breakthrough techniques used in analyzing systems and business operations. Charts are presented along with descriptive material. Creative thinking, operations research, engineering economics, and systems engineering are mentioned. A systematic approach is recommended, which consists of identifying the problem, determining objectives, identifying the controlling items, selecting study methods, developing a model, and using a parallel approach to the solution. The drafting of final reports part-way through the job is advised. After acceptance and execution are the business operations. The technique is illustrated with an example.

70

THE POLITICAL ECONOMY OF EFFICIENCY

Aaron Wildavsky

Public Interest, no. 8, Summer 1967, p. 30-48

Discussion of political systems and systems analysis and their interrelationship. The consideration of means and ends simultaneously and the problem of determining the objective are stressed. The original starting point was the cost-benefit analysis of government programs in order to secure an efficient allocation of resources. The program budgeting system introduced by the heads of Federal agencies in 1965 is examined, and a concept of political rationality is advocated. In the final section the author deals with political costs, benefits, economy, and efficiency.

71

THE POLITICAL ECONOMY OF EFFICIENCY COST-BENEFIT ANALYSIS, SYSTEMS ANALYSIS, AND PROGRAM BUDGETING

Aaron Wildavsky

Public Administration Review, vol. 26, Dec 1966, p. 292-310

Demonstration that three efficiency techniques - cost benefit analysis, systems analysis, and program budgeting - involve much more than mere economizing. The limitations in using them are pointed out. Political systems are discussed, as are political costs, benefits, and economy in achieving efficiency. A concept of political rationality is introduced, and economists and political scientists are compared against that standard.

72

SYSTEM ENGINEERING

Herman A. Affel, Jr.

International Science and Technology, Nov 1964, p. 18-26

Definition of system engineering. The methods used to solve technological problems associated with devising operational processes that meet human needs are described. The basic steps considered are problem definition, system criteria selection, system synthesis, system analysis, and implementation. The goal is to reduce functional relationships to hardware relationships. The importance of the operational environment is mentioned.

73

DESIGN OF OPTIMAL BUSINESS PLANNING SYSTEMS - A STUDY PROPOSAL

H. I. Ansoff and R. G. Brandenburg

Pittsburgh, Pa., Carnegie Institute of Technology, Graduate School of Industrial Administration, Sept 12, 1966 37 p

Proposal of a cost effectiveness methodology for planning systems design at the level of a whole business firm. The application of the methodology to the selection of the optimal design is discussed. Included in the design are plans for organizational guidelines and constraints and the processes and procedures for generating those plans. The relation of planning system attributes to firm and environmental attributes is emphasized.

74

OPTIMAL CONTROL

Rufus Oldenburger

New York, Holt, Rinehart and Winston, Inc., 1966 242 p

This book presents a theory of optimal control the objective of which is to optimize on the basis of entire response curves rather than by controlling single indices of performance. The theory is presented in the time domain, as it is more familiar to engineers than the phase-space approach. The problem of optimal control, important for adaptive control systems where the controller must automatically match its own characteristics to those of the system, is discussed extensively.

75

PLANNING AND CONTROL SYSTEMS A FRAMEWORK FOR ANALYSIS

Robert N. Anthony

Boston, Harvard University (Studies in Management Control), 1965 180 p

A framework for the analysis of management planning and control systems is set up in this book. Three main processes - strategic planning, management control, and operational control - are defined and their differences noted. The problems which can arise when these processes are confused or emphasized disproportionately are pointed out. Information handling and financial accounting are also discussed. The starting point recommended in designing planning and control systems is management control, and it is suggested that the central management control system be a financial system because money is a common denominator.

76

THE NEW UTOPIANS A STUDY OF SYSTEM DESIGN AND SOCIAL CHANGE

Robert Boguslaw

Englewood Cliffs, N.J., Prentice-Hall, Inc., 1965 213 p

This book compares system design using computers and automation with some of the concepts used by the builders of classical social systems. It is noted that many established fundamental errors are being incorporated into new systems. The formalist, heuristic, operating unit, and ad hoc approaches to system design are discussed and compared. Social structure and socio-politicoeconomic power are noted.

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77

COMPUTER INSTALLATION 1 - SYSTEMS AND PROGRAMS
Patrick D. Burns

Management Review, July 1966, p 23-27

Application of the systems design technique to the problem of computer installation in a corporation. The responsibility of the systems analyst in fact-finding and the importance of programming are discussed. Finally, the record conversion problem is handled

78

SYSTEMS ENGINEERING - A GROWING CONCEPT
E W Engstrom

Electrical Engineering, Feb 1957, p 113-116

Description of the systems engineering concept for solving complex problems in the development of new products, techniques, and services. Emphasis is on the adaptation of technology to people and their needs and the surmounting of human limitations. Operations research plays a small part. The application of systems engineering is illustrated by the examples of color television and military weapons

79

SYSTEM ENGINEERING
Merrill M. Flood

Management Technology, Monograph No 1, 1960, p 21-35

Discussion of techniques for approaching complex system engineering tasks, with examples of several problems. The main steps in system engineering are system concept, feasibility, development monitoring, and evaluation testing. Design parameters, input variables, the objective function, and relations and restrictions are necessary for modeling. Seven sequenced activities of the strategic approach are noted. The need for measurement standards and simulation is mentioned. Examples include a Mars expedition, anti-aircraft air defense, inventory control, guided missiles, and combat surveillance

80

WORK DESIGN
Gerald Nadler

Homewood, Ill., Richard D Irwin, Inc., 1963 837 p

The objectives for designing work systems in business and industry are emphasized in this book on work design. The techniques of model construction for work design are explained in 17 sections

81

SYSTEMS ENGINEERING - KEY TO MODERN DEVELOPMENT
Kenneth J. Schlager

IRE Transactions on Engineering Management, vol EM-3, July 1965, p 64-66

Outline of the systems engineering methodology for the development of a complex systems design. The main areas are (1) planning or the investigative phase, (2) analysis, (3) optimization, (4) integration or the hardware phase, and (5) evaluation. The need for specialized training in this new engineering field is stressed, and the importance of various applied mathematics is noted.

tems analysis and operations research are employed in aiding management selection of projects and opportunities. After the information-gathering phase, which considers needs, technical capabilities, and operational conditions, comes the planning phase. Finally, systems engineering is used for making technical and economic comparisons throughout the development stages and in field testing

83

PRINCIPLES OF AUTOMATED INFORMATION RETRIEVAL
William F. Williams

Elmhurst, Ill., Business Press, 1965 447 p 111 refs

This book is intended for the executive of either a large or a small organization to serve as an introduction to information retrieval systems and for persons specializing in this field as an instruction manual in the design and operation of information retrieval systems. The compelling reason for information retrieval systems can be found in the complexity of technological development which intensifies specialization, consequently widening gaps between disciplines. For business organizations, an important impetus for more efficient information retrieval systems is uncontrollable costs caused by duplication of efforts and, worse, duplication of errors. For the executive responsible for business functions which demand improved management and control of information, this book encourages decisions to improve these functions and furnishes adequate authority and background

84

SYSTEMS RESEARCH AND DESIGN, PROCEEDINGS OF THE FIRST SYSTEMS SYMPOSIUM, CASE INSTITUTE OF TECHNOLOGY, CLEVELAND, OHIO, APRIL 27, 1960

Edited by D. P. Eckman

New York, John Wiley and Sons, Inc., 1961 310 p

This book discusses a variety of problems and the need for the objectivity in the systems study of such problems. Any real systems study can encompass only a portion of the ultimate system, and, therefore, every system being studied is only a portion of a larger system. This is why almost all systems studies are directed toward an intermediate objective - economic value, political worth, purely technical performance, or a combination of these. The complete study of any problem involves three specific but interrelated tasks - systems analysis, design synthesis, and scientific study

85

SYSTEM ENGINEERING AN INTRODUCTION TO THE DESIGN OF LARGE-SCALE SYSTEMS

Harry H. Goode and Robert E. Machol

New York, McGraw-Hill Book Co., Inc., 1957 557 p 145 refs

The primary purpose of the book is to weld together the various segments of system design - a new set of tools, a new classification of parts, an organized approach, and a team of workers. The second purpose is to provide sufficient technical background for the engineer who is a member of the system-design team. The book presents methods in system design, places in its proper relative position each of the new sciences that serve system design, presents the central problem, functions, and languages of these sciences, and furnishes some practical information on the functioning of a system-design team

86

A METHODOLOGY FOR SYSTEMS ENGINEERING

Arthur D. Hall

Princeton, N.J., D. Van Nostrand Co., Inc., 1962 493 p

190 refs

The primary aim of this book on the methodology or process of systems engineering is to increase awareness and understanding of

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systems engineering as a process and to sharpen definitions and approaches to the main recurring problems of the process (problem definition, goal setting, systems synthesis, systems analysis, and choice among alternative systems) The comprehensive treatment given in the book provides essential insights, references, and some of the working materials which anyone inclined to systems engineering can use

87

SELECTIVE AUTOMATION BENEFITS FROM SYSTEMS ENGINEERING APPROACH

David P Herron

Automation, July 1967, p 65-70

Application of the systems engineering method to investment decisions concerning automation in a business enterprise. The basic steps in arriving at recommendations by determining costs, benefits, and savings in the selective automation of operations are outlined. The selection of a particular plan for automating and the implementation of that plan are discussed

88

THE BELL TELEPHONE LABORATORIES - AN EXAMPLE OF CREATIVE TECHNOLOGY

Mervin J Kelly

Royal Society (London), Proceedings, Series A, vol 203, 1950, p 287-301

Description of the concept of organized creative technology, as practiced by the Bell Telephone Laboratories. There are three basic operations. In research and fundamental development, new knowledge which might contribute to advancements in communications is sought. Then systems engineering is used to determine specific systems and facilities development projects, and, finally, specific programming of systems and facilities development is carried out, evolving laboratory and preproduction models. Laboratory housing, facilities, and services, and development programs for the military are discussed

89

LEATHERBEE LECTURER DISCUSSES "SYSTEMS" IN A CREATIVE CONTEXT

Burgiss Levin

Harbus News (Cambridge, Mass.), Mar 5, 1965, p 8

Brief discussion of systems and systems engineering. Various aspects of systems engineering are identification of needs, development planning, detailed designing, manufacturing, and the operation of the system. The relation to the future environment is important. Technical alternatives are determined to aid management planning. The concept is considered a logical problem-solving method, and certain areas of the concept are noted which can help in understanding it

90

YOU NEED SYSTEMS ENGINEERING

Gregory V Schultz

Factory, Apr 1964, p 80-85

Relationship of systems engineering to studies of complex manufacturing, processing, or service systems. It can deal with problems such as warehousing, production time, diversified production, product development, materials handling, marketing, and costs. Areas briefly covered include possible benefits, cost of systems engineering techniques, methods, and tools, the availability and training of systems engineering personnel, and the installation of a systems engineering project

91

SYSTEMS ENGINEERING - IMPLICATIONS FOR MANAGEMENT

David B Smith

Financial Analysts Journal, May-June 1965, p 119-127

Discussion of the importance of systems engineering to management planning and decision-making. A company is considered as a man/machine system with three levels - production and distribution at the base, management at the top, and an intermediate stage for communication of information and control. The possibility of automating the intermediate stage is explored, and the implications for management science are noted

92

SYSTEMS ENGINEERING

New York, Bell Telephone Laboratories, 1957 7 p

Brief and general discussion of systems engineering as related to telephone systems. Fields of activity, systems planning, theoretical and experimental studies, and personnel problems are described

93

SYSTEMS, SUB-SYSTEMS, AND SUPER-SYSTEMS

Au Tung and Thomas E Stelson

Carnegie Review, Apr 1967, p 9-12.

Investigation of the role of systems engineering in the planning, design, construction, and operation of large complex systems. The two key activities are system synthesis and optimization. In making decisions where time or other limiting factors prevent consideration of the whole system, the problem may be solved by dealing with component subsystems

94

LIFTING THE VEIL FROM SYSTEMS ENGINEERING

Gerald M Weinberg

Factory (Operation Update Workbook No 6), Apr 1966 11 p

Summary of systems engineering fundamentals for manufacturing managers. Systems engineering is defined as the science of controlling systems of high complexity. The four successive levels of knowledge - empirical or operational, construction, engineering, and theoretical - are discussed

95

AVOIDING AN ASTEROID

Time, June 16, 1967, p 54 ff

Brief discussion of ways to avoid a collision of the earth with an asteroid. The hypothetical problem was presented as an exercise for students in systems engineering at the Massachusetts Institute of Technology. The students organized into specialized groups to try to find a solution through deflection of the asteroid orbit or its destruction. Details are given on the management of the project, the calculations done by students using computerized techniques, and the probable success of the operation

96

THE MEASURE OF MANAGEMENT DESIGNING ORGANIZATIONS FOR HUMAN EFFECTIVENESS

Eliot D Chapple and Leonard R Sayles

New York, Macmillan Co, 1961 218 p

This book about organization management is a product of the continuing research in human behavior in organizations. Previous efforts most frequently concentrated on purely technical decision-making or treated human problems of organization primarily as

S1 THE SYSTEMS CONCEPT

psychological issues. This book attempts to show organizational problem-solving through the use of measurement, which provides an adequate basis for executive action because it describes in unambiguous, operational terms how people will act in given situations.

97

MANAGEMENT SCIENCES AND MANAGEMENT - SOME REQUIREMENTS FOR FURTHER DEVELOPMENT

A Charnes and W W Cooper
Management Science, vol 13, Oct 1966, p. C-3 to C-9 13 refs
Contracts No Nonr-760(24), NR 047-048, No Nonr-1228(10),
NR 047-021

Description of the management scientist's role as implementer in operations research. The Churchman-Schaublatt codification, consisting of (1) the separate functions position, (2) the communication position, (3) the persuasion position, and (4) the mutual understanding position, is described and explained. A further extension is suggested.

98

CHANGING PATTERNS IN MANAGEMENT THEORY

David I Cleland and David C Dellinger
Aerospace Management, vol 1, no 1, Spring 1966, p 3-11
9 refs.

Analysis of the qualitative and quantitative concepts in management theory as segments of an integrated whole and not as separate entities. The four managerial schools - traditional, human behavior, mathematical, and systems approaches - are discussed, together with the decision-making functions of the manager. An example in the form of a weapons system management problem is given.

99

AUTOMATION AND THE MANAGER

John Diebold
International Management Congress, 11th, Paris, France, June 26, 1957, Paper 25 p

Treatment of automation as a management problem. The need for executives to understand the technicalities of computer programs and to manage correctly the automation process in terms of objectives, costs, personnel, and long-range results is stressed.

100

WHAT THE PROJECT GAVE GLACIER METAL

Patricia Farrant
Management Today, July 1967, p 78-83, 134, 136

Discussion of the Glacier Metal project, a general theory of management and labor relations applied to an English industrial organization. The project involves organizational structure, practices, procedures, relationships, aims, and environment as they exist in fact, attempting to formalize organization and procedure to best achieve company objectives within the limits of its environment and the resources it possesses. This is achieved by joint consultation - i.e., final agreement between management and the works council. It is suggested that the project may be helpful to general management problems also.

101

DIFFERENTIATION AND INTEGRATION IN COMPLEX ORGANIZATIONS

Paul R Lawrence and Jay W Lorsch
Administrative Science Quarterly, vol 12, June 1967, p 1-47

Results of a study of six industrial organizations with similar operations. A relationship was found between the extent to which

differentiation and integration in each organization responded to external environmental conditions. The study was organized on the basis of three subsystems - sales, research, and production - admitting a number of hypotheses on degree of structure, interrelation of members, time factor, goal orientation, and relation among differentiation, integration, and organizational performance. The hypotheses are discussed in depth, drawing the conclusion that organizations with integrative devices meeting the requirements of these hypotheses will be able to achieve both a high integration and high differentiation, although they are basically antagonistic. Some recommendations are made for further studies into ways of coping with the new environments science and technology are creating.

102

MANAGEMENT SYSTEMS WORKING CONCEPTS AND PRACTICES

Adrian M McDonough and Leonard J Garrett

Homewood, Ill., Richard D Irwin, Inc., 1965 311 p

The book presents a nontechnical exposition of the concepts and techniques of management systems, with particular emphasis on information systems. Management problem definition, manpower planning and control, and data processing are given as the three most important aspects which should be considered in the design of information systems. The need for a thorough analysis of information needs is pointed out, and the interrelationships between organization people and organization systems are described. A management game provides the background for much of the discussion.

103

MANAGEMENT

William F May and E T Klassen

American Can Co., 1966 Annual Report, Feb 13, 1967 2 p

Description of the systems analysis approach to research, production, marketing, and personnel relationships of the American Can Co. The opening of the company's marketing headquarters in New York is mentioned, and new products are listed. Details on the company's advertising policy and application of computer technology are noted.

104

GOOD SYSTEMS NEED GOOD PEOPLE

Harold Mayfield

Supervisory Management, July 1967, p 55

Discussion of the relationship between systems and people. The role of the manager in building a strong organization of capable people, even if the process is slow, to operate the systems with maximum efficiency is stressed.

105

MANAGEMENT BY SYSTEM (2nd Edition)

Richard F Neuschel

New York, McGraw-Hill Book Co., Inc., 1960 359 p

This book describes the benefits possible with modern business systems and procedures. How a systems and procedures staff should work is explained and the techniques the staff should use in designing dynamic, workable systems that permit a complex business organization to coordinate and control its actions with precision and economy are described. Included are techniques on how to conduct an electronics feasibility study, develop integrated data processing, and improve management-information channels for more effective planning and control.

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106

MANAGEMENT SYSTEMS A BOOK OF READINGS

Edited by P. P. Schoderbek

New York, John Wiley and Sons, Inc., 1967 483 p

The book consists of a review of available literature in modern management systems embracing diverse disciplines. The contributions from leading authorities have been arranged in logical sequence with an introduction for each essay that places the subject matter in focus and a summary that leads the reader to the next concept. Material from the fields of engineering, accounting, data processing, business, and sociology is included.

107

MANAGEMENT A SYSTEMS ANALYSIS

Stanley Young

Glenview, Ill., Scott, Foresman and Co., 1966 436 p

A systems analysis of management, the problem-solving or decision-making segment of an organization, is the subject of this book. Integrating managerial techniques into a single operating system is emphasized. After a study of decision-making in organization, administration is considered, including installation, maintenance, and control of a planned system. A hospital case study, interorganizational cooperation, individualism, and a bureaucratic model are also discussed.

108

THE AGE OF AUTOMATION THE BBC REITH LECTURES, 1964

Leon Bagrit

London, Weidenfeld and Nicolson, 1965 86 p

The application of automation to industrial manufacturing and the potentialities which might be realized by such application are discussed in this book. The nature of automation and its range of applications are described. Political considerations, industrial and economic consequences, and opportunities for social enrichment are outlined, and education for the era of automation is discussed.

109

GENERAL SYSTEMS THEORY AND PSYCHIATRY - AN OVERVIEW

Ludwig von Bertalanffy

IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967

Washington, D.C., American Psychiatric Association, 1967, p. 86, 87

Discussion, from an overall point of view, of the application of general systems theory to psychiatry. Systems science should provide a conceptual framework better adapted to human behavior than the Robot Model, dominated by the stimulus-response scheme. There have been two developments of systems science in psychiatry. One concerns feedback, cybernetics, servomechanisms, systems engineering, and computer science. The other considers the whole living organism and concepts such as dynamic interaction, open systems, and the negentropic tendency to higher organization. Active personality system, developmental differentiation, non-homeostatic functions, regression, ego boundary, symbolic activities, and modern psychotherapy developments for individuals, families, groups, and societies are also discussed.

110

THE SYSTEM OF VALUES

IN UNDERSTANDING OTHER CULTURES

Ina Corinne Brown

Englewood Cliffs, N.J., Prentice Hall, Inc., 1963, p. 95-117

Discussion of the system of values which societies possess. Examples of different values are given and compared. Some specific instances include names, sexual customs, lying, stealing, murder, sorcery, and witchcraft. The "carrot and stick" method of maintaining a value system is described. It is noted that some colonial actions tended to produce lawlessness and disorder when a native value system was destroyed and replaced by another value system.

111

NORMALITY VIEWED AS A SYSTEM

Roy R. Grinker

IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967

Washington, D.C., American Psychiatric Association, 1967, p. 90, 91

Summary of the application of general systems theory to the matter of mental health - specifically, normality and illness. The problem of value systems is avoided by considering value systems as attributes of a culture, suitable for scientific study. Thus the total system would include hereditary data, physical and emotional experiences during maturation and development, psychodynamics, behavior at maturity, the sociocultural matrix, and specific environments. Normality and illness are considered as processes in the system. The processes involve the integration over many variables, and the integrations determine the stress responses, and, hence, the health. The subjects of developmental reversibility and evolution are also discussed.

112

SOCIAL SIGNIFICANCE OF TECHNOLOGICAL ADVANCE

Ida R. Hoos

California, University, Space Sciences Laboratory, Social Sciences Project Internal Working Paper No. 67, June 1967 26 p 21 refs

Grant No. NsG-243-62

Consideration of the relationship of science and technology and the human aspects of life, stressing the ethical point of these interactions. The loneliness and frustration of man in front of the machine are analyzed, together with all the implications in the computer age for education and the sociological and psychological consequences of the "coin-box" morality and the anomie of society. It is concluded that science and technology must be a part of instead of apart from man's moral commitment to the past, present, and future of all mankind.

113

SYSTEMATIC ASPECTS OF HUMAN INTERACTION

Don D. Jackson

IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967

Washington D.C., American Psychiatric Association, 1967, p. 88, 89

Discussion of the organization of sequential messages in human interactional systems, such as biologically intact families. The ongoing interactional systems are the major area of study for determining the pragmatic impact of communication phenomena. The definition of families as rule-governed systems is illustrated by restrictiveness and family rule development. It is noted that the definition of a system, the principle of isomorphy, the function of time, the environment of the system, and the principle of open and closed systems must be taken into account when a system is described.

114

REGULATION AND CONTROL IN LIVING SYSTEMS

Edited by H. Kalmus

New York, John Wiley and Sons, Inc., 1966 468 p

This book on regulation and control in living systems employs the engineering approach to the study of life and attempts to restore

S1 THE SYSTEMS CONCEPT

communications between engineers and biologists. There are sections covering cells and individuals, development and genetics, and groups and populations. The relevant philosophical, mathematical, and technological problems have been treated in detail by specialists on biological topics

115

GENERAL SYSTEM THEORY AND MULTIPLE FAMILY THERAPY
H Peter Laqueur
IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967
Washington, D C, American Psychiatric Association, 1967, p 95, 96

Description of the application of general system theory to the multiple family therapy community. The multiple family therapy community consists of the simultaneous presence of several primary patients and the closest relatives of the primary patients. This social system consists of several subsystems interacting through various identification possibilities to produce new perceptions and learning mechanisms not obtainable through the patient-analyst interaction, the peer group therapy situation, or the primary patient-relatives therapy situation

116

APPLICATIONS OF GENERAL SYSTEMS THEORY IN INDUSTRY AND COMMUNITY
John MacIver and E. Joseph Charny
IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967
Washington, D C, American Psychiatric Association, 1967, p 96, 97

Description of the use of general systems theory in analyzing psychiatric aspects of social organizations in industry, a community, or educational institutions. The general systems approach overcomes the lack of a working conceptual framework with a common process language for ordering the interface of two interacting systems. The use of appropriate methods at the most efficacious location for psychiatric intervention is determined by clarifying the hierarchical structure

117

THE INDIVIDUAL ORGANISM AS A LIVING SYSTEM
James G. Miller
IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967
Washington, D C, American Psychiatric Association, 1967, p 87, 88

Consideration of the individual organism as a living system. The structure of a living system is distinguished from its process. Each living system contains a number of critical subsystems, classified into three groups - those involved in the metabolism of matter-energy, those involved in the metabolism of information, and those involved in the metabolism of both matter-energy and information

118

A GENERAL SYSTEMS APPROACH TO FAMILY THERAPY AND HUMAN MATURATION
Norman L. Paul
IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967
Washington, D C, American Psychiatric Association, 1967, p 94, 95

Development of a general systems orientation to human maturation in the context of family therapy. The systems aspect consists of the classes of sequential emotional experiences necessary to achieve relational skills, especially, empathy. Three relational subsystems are considered - namely, transactions with oneself, with family, and with strangers. Sharing of material of one subsystem among other subsystems can help achieve empathy and verify the universality of various feelings previously thought unique, thus making meaningful dialog possible

119

A GENERAL SYSTEMS APPROACH TO PROBLEMS IN GROWTH AND DEVELOPMENT

Nicholas D. Rizzo, William Gray, and Julian S. Kaiser
IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967
Washington, D C, American Psychiatric Association, 1967, p 93, 94

Outline of a general systems theory approach to the problems of growth and development of adolescents that is both pragmatically and theoretically useful. The concept of maximization is applicable to both the individual and the ecological systems. Both spontaneous activity and reaction are considered. It is noted that there are at least ten interlocking, overlapping, interconnected systems, and problems arise from interfaces between related systems and dysfunction. The underachiever, the disruptive maladjusted adolescent, and the potential suicide victim are considered

120

THE ECONOMY AND OTHER SOCIAL SUB-SYSTEMS
IN THE SOCIOLOGY OF ECONOMIC LIFE

Neil J. Smelser
Englewood Cliffs, N J, Prentice-Hall, Inc., 1963, p 36-68
109 refs

Discussion of economic sociology at the societal level. For purposes of the discussion, society is divided into a number of subsystems - one of which is the economy - to show the operation of economic and noneconomic variables in the interaction among these subsystems at the level of society as a whole

121

ENVIRONMENTAL CORRECTION AS A SYSTEM PROCESS

John P. Spiegel
IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967
Washington, D C, American Psychiatric Association, 1967, p 89, 90

Proposal of a "systems" model, based on interrelations among environmental subsystems, providing environmental change in community agencies. Psychiatrists are increasingly being drawn into efforts to formulate designs for the early detection, prevention, and correction of mental illness - or the maximization of mental health - through modifications of the environment. The resistance of professional personnel, community agencies, and governmental bureaucracies to programs attempting to change traditional institutional functions in the community are described

122

UNIFYING CONCEPTS LINKING THERAPEUTIC AND COMMUNITY PROCESS

Montague Ullman
IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH., MAY 8-12, 1967
Washington, D C, American Psychiatric Association, 1967, p 92, 93

S2 RECENT DEVELOPMENTS

Development of unifying concepts linking therapeutic and community processes. The power deficit and freedom concepts are two links between the community process, fostering maladaptive behavioral patterns, and the therapeutic process, attempting to lessen the number of psychiatric "casualties."

123

SOCIETY FOR GENERAL SYSTEMS RESEARCH (L3)
Edwin A. Weinstein

Science, vol 155, Feb 17, 1967, p 888

Summary of various opinions of participants in a symposium on symbolism. Symbolism was defined as an open system of mutually interacting components with meaning independent of biological drives. The speech of schizophrenics and the role of language in shaping political perceptions and actions were discussed.

124

CYBERNETICS OR CONTROL AND COMMUNICATION IN THE ANIMAL AND THE MACHINE (2nd Edition)

Norbert Wiener

Cambridge, Mass., M I T Press, 1961 212 p

This book discusses the various aspects of cybernetics - in particular, the problems of control and communication in animals and machines. There are chapters dealing with information theory, feedback, computing machines, and psychopathology. Two chapters that were not in the first edition are concerned with learning, self-reproduction, and self-organization.

S2 RECENT DEVELOPMENTS

125

MOST NOTORIOUS VICTORY MAN IN AN AGE OF AUTOMATION
Ben B. Seligman

New York, Free Press, 1966 441 p

The economic, social, and psychological effects of automation and computerized technology are considered in this book. Man's condition at time when his fate is controlled by technology is analyzed. The author's thesis that there is "an internal drive with an independent force that conditions man and his works" is reviewed. The history of the computer since World War II and its role today are discussed. The threat of complete automation to man's individuality and his relation to others is examined.

126

PROJECT HINDSIGHT

Philip H. Abelson

Science, vol 154, Dec 2, 1966, p 1123

Discussion of the purpose and some conclusions of Project Hindsight, a retrospective study conducted by the Department of Defense (DOD) of 20 proven weapon systems in order to understand what factors contributed to the successful management of the appropriate R&D programs. The history of an Event (a contribution from recent science and technology important to improved cost or effectiveness) is traced. Since the vast majority of Federal funds for academic research is furnished by mission-oriented agencies, such as DOD, some of the findings are particularly relevant for university scientists.

127

THE SPACE PROGRAM A MODEL FOR TECHNOLOGICAL INNOVATION

Sumner Myers

Looking Ahead, vol 14, Feb 1966, p 1-4, 7, 8

Discussion of innovation, the introduction of an invention into the economy by a business firm. The civilian space program

accomplishments in innovation and technology improvement are a model for forward policy planning and research. The importance of innovation at the company level is discussed.

128

SPINOFFS FROM SPACE

News Front, May 1967, p 18-21

Description of benefits derived by the civilian economy from NASA's scientific and technological programs. The availability of scientific and technical information about inventions and innovations is necessary for continual development in the aerospace and other industries. The gathering, classifying, cataloging, and dissemination of such information are discussed, and particular attention is paid to the NASA technology utilization program.

S3 SPECIFIC FUNCTIONS

129

AIRLINES PREVIEW ELECTRONIC REDCAP

Business Week, Aug 19, 1967, p 126, 128

Description of a full-scale working prototype of a computer-controlled baggage-handling system designed to handle luggage from six Boeing 747 jets (500-passenger planes) simultaneously. A big future in the total systems concept is indicated.

130

ALL ROADS LEAD TO SYSTEMS, SAY TOP MH EXPERTS

Material Handling Engineering, Jan 1967, p 53-63

Opinions of material handling experts on systems, their planning, management, and financing. Facilities planning, worker availability, technology and regulation, bulk handling, distribution, bin design, standards, and future developments are among the topics discussed.

131

AT THE END OF THE DAY NO INVENTORY

Modern Office Procedures, Oct 1966, p 28-31

Description of a manufacturing and paper work system, combined with a computerized conveyor, at Reynolds Tobacco Co. Benefits accruing from the system are (1) closer control of finished goods inventory, (2) avoidance of the need for storage space and additional handling, (3) insurance of fresh product to the customers, and (4) fast working capital recovery.

132

IMPROVING THE PHYSICAL LAYOUT OF MERCHANDISE IN WAREHOUSES

Ronald H. Ballou

Journal of Marketing, vol 31, July 1967, p 60-64 7 refs

Demonstration that the technique of linear programming does provide for more optimal arrangements of merchandise in typical warehouses, both in the reserve and the assembly sections. Improving the physical layout of goods in warehouses leads to cost reductions in handling goods, which can amount to more than 50% of total operating expenses and average as much as 46% of revenue.

133

RHOCHREMATICS AND ORGANIZATION ADJUSTMENTS

Stanley H. Brewer and James Rosenzweig

California Management Review, no 3, Spring 1961 23 p

Investigation of Rhochrematics, a new science of material and information flow, and exploration of some of the changes in traditional management practices and channels of authority required when a total systems approach to physical distribution is adopted. Any system is made up of a number of subunits or operations, all of which perform functions of major or minor proportions.

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These functions might be performed independently in optimal fashion, but not necessarily in the best interests of the system as a whole. Focusing attention on the material flow process enhances the probability of optimizing the whole system rather than its separate parts. The growing revolution in information gathering, transmission, and processing provides new dimensions for managing material flows.

134

ORGANIZING FOR EFFECTIVE PHYSICAL-DISTRIBUTION MANAGEMENT

Philip F. Cannon
New York, American Management Association (AMA Management Report No. 49), 1960, p 14-26

Details on how to organize a physical-distribution management section so as to avoid the creation of gray areas between manufacturing and sales. Singled out as the biggest inconvenience is the fact that too often the responsibility for physical distribution is split among other functions. The planning function and the proper responsibilities of the distribution function are discussed, and through a series of charts and graphs solutions are given to the problem.

135

DISTRIBUTION MANAGEMENT TIPS

Transportation and Distribution Management, Dec 1966, p 17, 18
Brief review of some of the most recent terms added to the material handling concepts vocabulary and explanation of what the concepts do for the material handling operation

136

THE PHYSICAL DISTRIBUTION FUNCTION AS IT LOOKS TO THE OPERATIONS RESEARCH MANAGER

E. L. Dougherty
National Council of Physical Distribution Management, Semi-Annual Meeting, Chicago, Ill., Apr 6, 1966, Paper 25 p

Discussion of the relationships between operating managers and operations research managers. Operations research is defined as cooperative problem-solving. It is a process in which a staff group specializing in systematic problem-solving sits down with line and staff from an operating department (in the case presented, from distribution management). This kind of working relationship implies certain professional and ethical standards of conduct on the part of operations research personnel.

137

INTEGRATING DISTRIBUTION SERVICES AT THE WAREHOUSE

C. William Drake
Traffic World, June 29, 1963, p 33-47

Demonstration that integrating distribution services at the warehouse is the most effective way of keeping mounting distribution costs down while maintaining high standards of customer service.

138

THE RISE OF THE PD MAN.

Marketing Forum, Oct 1966, p 4

Discussion of the responsibilities of a physical distribution (PD) manager. He has been displaying a growth pattern familiar to marketing men - a plea for attention, demand for recognition, and claim for authority. The specific terms are (1) status equal to other major corporate functions and (2) control over a wide variety of operations, some of which fall into marketing's orbit.

It is concluded that the PD man should orient himself to the marketing concept.

139

THE GENESCO DISTRIBUTION SYSTEM

New York, Dasol Corp., n.d. 38 p

Discussion of the objectives, design, and implementation of the Genesco distribution system. The system has accomplished an efficient perpetual inventory system, a productive warehousing and order-filling operation, and a fundamental change in management concepts.

140

THE SYSTEMS APPROACH IN DISTRIBUTION ENGINEERING THE STATE OF THE ART

Allan Harvey

American Institute of Industrial Engineers, Annual Conference and Convention, 18th, Toronto, Canada, May 25, 1967, Paper 15 p

Discussion of the systems approach in distribution engineering, concerning management expectations from distribution engineering. The state of the art is that management is thinking in terms of systems engineering rather than in terms of "bits and pieces" solutions. Effective systems cannot be built up from bits and pieces. Only total systems approach can be practical as a long-term objective and as a guide to current decision.

141

BUSINESS LOGISTICS MANAGEMENT OF PHYSICAL SUPPLY AND DISTRIBUTION

J. L. Heskett, Robert M. Ivie, and Nicholas A. Glaskowsky, Jr
New York, Ronald Press Co., 1964 557 p

Concepts and definitions are given to establish a basic foundation for the study of business logistics. Physical supply encompasses the problems and techniques of providing a continuing supply of raw materials to the manufacturer or goods to the merchandiser. Physical distribution pertains to the movement of a product from supplier to customer or ultimate consumer in coordination with manufacturing and market activities.

142

HOW DU PONT ATTACKS DISTRIBUTION COSTS

J. C. Jessen

Modern Materials Handling, Sept 1964, p 37-43

The Du Pont Co.'s approach to cutting costs in materials handling, packaging, warehousing, and distribution. This systems approach, according to careful analysis, can cut distribution expenditure as much as 10%.

143

HOW DU PONT USES THE SYSTEMS APPROACH NEWEST COST-CUTTING TOOL

Modern Materials Handling, Sept 1958, p. 110-113

Discussion of how Du Pont uses the systems approach to cut costs in handling, packaging, etc. This method can lead to a better solution of problems than might be expected, is economic, improves customer service, prevents the accumulation of huge inventories, and improves quality control.

144

IN AND OUT OF A WAREHOUSE IN 45 MINUTES

Business Week, July 6, 1957 3 p

Description of a goods-handling system that can turn a warehouse into a continuous flow distribution center. At the Mangel Stores

S3 SPECIFIC FUNCTIONS

Corp 's New York warehouse, it takes only 45 minutes to receive merchandise from suppliers, sort and pack it, and load it onto trucks for shipments to 124 chain stores

145

PHYSICAL-DISTRIBUTION MANAGEMENT FUNCTIONS AND PRACTICES

Ross E Jones
New York, American Management Association (AMA Management Report No 49), 1960, p 7-13

Discussion of functions and practices in physical distribution management, stressing the need for physical distribution to become an independent division operating at the same level as the sales and manufacturing divisions with which it is connected. A breakdown of the functions of the distribution sector is given, including transportation, materials handling, warehousing, inventory control, production planning, and administration. Each of these functions is thoroughly analyzed, and guidelines are given to achieve reduced costs, improved services, and increased profits

146

MODERN METHODS FOR LOCAL DELIVERY ROUTE DESIGN

Richard B Maffei
Journal of Marketing, vol 29, Apr 1965, p 13-18

Study of modern methods for local delivery route design combining customer data and simulation. The simulations seemed to have their greatest potential use in the study of how estimated costs and profits changed under various "assumed" route conditions

147

THE LOGISTICS OF DISTRIBUTION

John F Magee
Harvard Business Review, July-Aug 1960, p 89-101

Outline of ways by which progress in "industrial logistics" can be achieved. As manufacturing efficiency has increased and product cost has decreased, costs have grown. Physical distribution costs are a significant share of these, since physical distribution has considerable impact on warehouse requirements, customer service, and operating costs. By linking all relevant factors together and analyzing physical distribution as a system, it may be possible to improve warehouse location, step up service, and reduce costs

148

MARKETING AND PHYSICAL DISTRIBUTION

Marketing Forum, Oct 1966, p 16-20

Definition of physical distribution and discussion of the status of corporate structure. Several examples are cited to show the close relationship of distribution to marketing functions. Differences in outlook between marketeers and distributors are discussed

149

MAN AS A SYSTEMS COMPONENT

Modern Materials Handling, MMH Systems Round Table - 2, Sept 1966 12 p

Discussion of the making of a man into an effective systems component in the conception, design, and installation of systems. In the research phase of systems planning, it is important to obtain valid data. Guaranteeing job security and involvement in the design phase produces acceptance of change. Motivation, by establishing a sense of accomplishment and satisfaction, is important in the operating phase, and stressing the important part of paperwork in a job helps in the control phase. The role of training is reviewed

150

MATERIALS HANDLING IN YOUR PLANT

H B Maynard, L West Shea, William E Kappler, and J D Loftis

Dun's Review and Modern Industry, Apr 1958, p 122-131

Discussion of the integration of materials handling with other segments of manufacturing. From 35 to 75% of all production costs are accounted for by materials handling. Advantages of monorail systems, conveyors, fork-lift trucks, driverless tractor and train, and unit load concept (pallet) are discussed. Other factors, such as number of floors, ceiling heights, door widths and heights, floor surfaces, and structural framework, are considered

151

MHE GUIDE TO SYSTEMS PLANNING

Material Handling Engineering, Apr 1965, p 71-108

Guide to material handling engineering systems planning. Systems planning rationales and profits are discussed. The advantages of employing feasibility and simulation studies are examined. A system is traced from initial ideas to final hardware. Installation and debugging are also covered

152

MODERN DEVELOPMENTS IN WAREHOUSING

Publishers' Weekly, June 23, 1958, p 41-45

Examination of warehousing and shipping theories in distribution engineering. The impact of technology on materials flow and storage is discussed. Warehousing in the book industry is examined. The results of paperwork simplification in the book industry cost reduction program are reported

153

TO REACH THE BEST, KNOW WHAT SYSTEMS REALLY ARE

Gerald Nadler

Modern Materials Handling, MMH Systems Report, July 1965, p 39-52

Description of an ideal systems approach to systems planning, with the highest technology balanced against the best cost. The approach determines the best possible system and provides built-in adaptability for future changes. It considers theoretical ideal, ultimate ideal, and technologically workable ideal systems, with cost, or other conditions, applied to the last. It is recommended that the seven elements essential to a system - function, input, output, sequence, environment, equipment, and method - be included in any study of a system. The ten steps in planning the best system are (1) determining the function, (2) developing ideal systems, (3) gathering information, (4) developing alternative suggestions, (5) selecting the feasible system, (6) formulating the system, (7) reviewing the designs, (8) testing the system, (9) installing the system, and (10) measuring performance

154

PHYSICAL DISTRIBUTION - FORGOTTEN FRONTIER

Robert P Neuschel

Harvard Business Review, vol 45, Mar -Apr 1967, p 125-134

Investigation of physical distribution neglect in industrial companies. The importance of control information, personnel competence, and distribution economics to product distribution is noted. Distribution performance pattern, information usage, and other tables are given for control information. Personnel competence factors such as transport method selection, negotiations with carriers, and equipment use optimization are discussed. Facility location, customer selection, and customer service are distribution economics factors. The traffic department, transportation, and total logistics concepts are also important in the overall problem

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155

NEW STRATEGIES TO MOVE GOODS

Business Week, Sept 24, 1966, p 112-136.

Examination of physical distribution strategies in modern companies. A discussion of various strategies is illustrated by examples from some large manufacturers. Computer technology is shown to be gaining ascendancy in retail marketing. The uses of computer modeling are illustrated. New transportation methods, such as inland waterways and the large capacity transport jets, are discussed.

156

COMPUTER CONTROL OF MATERIALS HANDLING

Ronald P. Noonan

National Security Industrial Association, Joint Industry-Military Packaging and Materials Handling Symposium and Exposition, 7th, Washington, D. C., Feb 10-12, 1964, Paper 22 p

Discussion of computer control in warehousing and materials handling for large-scale cost reduction. The computer-controlled system installed by the Honeywell Corp. at the Sara Lee bakery in Deerfield, Ill. is examined in detail.

157

SIMULATION - TOOL FOR BETTER DISTRIBUTION

Harvey N. Shycon and Richard B. Maffei,

Harvard Business Review, vol 38, Nov-Dec 1960, p 65-75

Study of the simulation of distribution problems and simulation requirements at the Heinz Co. The customer characteristics of geographic location, order sizes and frequency, volume of purchases, and variety requirements are specified, as are the geographic location, production capacities by product line, and product mix factors for factories. Warehouse functions are explained and considered in the model, while direct shipping is not because it does not affect optimal placement of mixing points and warehouses. The computer program is explained, and the system is optimized. The limitations of computer simulations are discussed.

158

DISTRIBUTION PROGRAMS IN MARKETING PLANNING A SYSTEMS APPROACH

M. E. Stern

New York, McGraw-Hill Book Co., Inc., 1966, p 82-104

Investigation of the physical distribution function for use in systematic market planning. Basically, an evaluation of physical distribution programs involves a comparison of the profits due to increased availability with the additional costs required to obtain the increase in availability. A widely accepted inventory management system is discussed. Warehouse systems and the selection of transportation media are also examined.

159

HOW TO MANAGE PHYSICAL DISTRIBUTION

John F. Stolle

Harvard Business Review, vol 45, July-Aug 1967, p 93-100

Analysis of organizational principles for physical distribution management. The cases of various companies are outlined to show lost cost reduction opportunities in distribution from scattered responsibility. The tables of organization for various management configurations are given.

160

AUTOMATED CENTRAL STORAGE SERVES JOB-LOT PRODUCTION

Modern Materials Handling, vol 22, Feb 1967, p 50-54

Description of the automated central storage system for plant-wide production at the Allis-Chalmers plant in Norwood, Ohio. The

17% cut in total manufacturing area and 25% boost in plant capacity achieved are noted. The operation of the twin-load stacker cranes and the filing system are described. The storage link to production is discussed.

161

IT DOESN'T TAKE A MILLION TO MODERNIZE A WAREHOUSE

Modern Materials Handling, vol 22, Mar 1967, p 64-67

Example of how a small warehouse can be modernized for more efficient operation. Small company warehouse modernization is illustrated by Steelcraft Tools' \$50,000 modernization investments which led to quicker shipments, 15% increase in sales, 50% increase in storage capacity, and labor cost reduction. This was done by applying sound engineering principles. Palletizing is an integral part of the Steelcraft system.

162

SYSTEMS DEBUGGING - THE CRITICAL PROBLEM IN HANDLING TODAY

Modern Materials Handling, MMH Systems Round Table - 1,

May 1966 16 p

Consideration of the problem of debugging a system when it first begins to operate, a problem which concerns not only operators, but also planners and designers. One possible solution is to implement a large plan in a modular fashion. Also, management should consider the time necessary for debugging when planning. The use of backup systems is another possibility. The training of personnel is mentioned, and the transition from debugging to maintenance is noted.

163

SYSTEMS PLANNING IN THE ERA OF CHANGE

Modern Materials Handling, MMH Systems Round Table - 3,

1966 16 p

Analysis of materials handling problems in systems planning, with particular emphasis on the rapid change of technology. Continuing education is cited as a means of updating the technical competence of personnel. The need to consider the effects of externals on the system is stressed, and a broader scope of materials handling is thought to be necessary. Increasingly complex situations can be solved with the aid of computers. The need for valid standards of measurement is noted.

164

TIMKEN THROWS AWAY THE BOOK

Business Week, Feb 19, 1955, p 62-64

Discussion of the unorthodox materials handling and storage system at Timken Roller Bearing in Canton, Ohio. Timken disperses steel and parts outdoors and hauls with straddle trucks instead of cranes. A savings of \$300,000 to \$350,000 in the initial cost of plant was effected. Lead time for production was cut by 20%. Radio direction is the nerve center for the system.

165

TO THE RESCUE? CAN ED CUDAHY SAVE CUDAHY PACKING? EVEN HE DOESN'T KNOW.

Forbes, Mar 1, 1964, p 34

Description of Cudahy Packing Co.'s efforts to stave off collapse. Union trouble encountered at their \$10 million streamlined Omaha plant is discussed. Modernizations are noted in their accounting system and production and livestock buying techniques.

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166

IDENTIFYING AND CONTROLLING THE COSTS OF PHYSICAL DISTRIBUTION

Paul A Wassmansdorf

New York, American Management Association (AMA Management Report No 49), 1960, p 33-39

Analysis of cost problems and cost analysis in physical distribution, from the point of view of the customer. The analysis is made through order-generating and order-filling costs - i.e., sales work and logistics work, respectively. Hidden distribution costs - e.g., the cost of lost sales - are discussed, and two tools for solving the problem are proposed. One is that the flow of a product be visualized as continuous from raw materials to end user, and the other is that marketing logistics is controllable as a system. Some basic guidelines for cost savings under the total competition concept are given.

167

A SYSTEMS STUDY OF POLICY FORMULATION IN A VERTICALLY-INTEGRATED FIRM

Dan I Abrams, Edward B Roberts, and Henry B Weil

American Association for the Advancement of Science, Society for General Systems Research Session, Washington, D C , Dec 26, 1966, Paper 32 p

Analysis of Industrial Dynamics - a feedback systems-oriented approach to dynamic socio-economic problems. Its techniques include feedback systems analysis and computer simulation of complex models. Industrial Dynamics is used for investigating, understanding, and experimenting with the process of goal achievement in a vertically integrated firm where the opportunity for conflict among performance measures, and therefore the lack of clarity as to how the measures mold behavior, is probably greatest.

168

SYSTEMS APPROACH TO MARKETING

Lee Adler

Harvard Business Review, May-June 1967, p 105-118 8 refs

Discussion of the systems approach to marketing, an approach that represents the leading edge in both marketing theory and practice. The systems concept can teach how businesses really behave in the marketing arena, thereby extending managerial leverage and control. It can help to confront more intelligently the awesome complexity of marketing, to deal with the hazards and opportunities of technological development, and to cope with the intensification of competition. The systems approach is a means of converting marketing into a more scientific pursuit.

169

PAYOUT FROM PRODUCT MANAGEMENT

B Charles Ames

Harvard Business Review, vol 41, Nov -Dec 1963, p 141-152

Analysis of the surge of dissatisfaction with the way product managers and the product manager concept are working out. Almost anything that can be said about the product manager applies equally to the market manager. The difference between them resides in the marketing circumstances that make one approach more effective than the other. The product manager approach has been found to be most appropriate for companies with a number of different products that have to be produced and marketed through the same manufacturing, marketing, or sales divisions. In both cases there is a member of the management group with high-level responsibility for getting a product to market without any direct-line authority over the full range of activities required to get the job done.

170

HOW TO PLAN PRODUCTS

R Q Armitage

Management Today, July 1967, p 92-96

Description of ways to develop new products and optimize profits on existing ones. A coordinated program with emphasis on future

product development is necessary. It is noted that a balance should be kept between production resources and consumer wants.

171

MAKING MARKETING RESEARCH MORE EFFECTIVE BY USING THE ADMINISTRATIVE PROCESS

Harper W Boyd, Jr and Steuart Henderson Britt

Journal of Marketing, vol 29, Feb 1965, p 13-19 20 refs

Demonstration of how use of the administrative process can make marketing research more effective. Many problems encountered by business in making marketing research more efficient indicate the need for a clearer understanding of the decision-making process by both marketing research executives and management executives. Marketing research executives can provide management executives with information which will help them in solving problems. Thus the marketing researcher may be called upon to play an increasingly important role in aiding the decision-maker to set objectives, develop plans and organize to carry them out, and control and reappraise the activities of the firm.

172

BREAKTHROUGH AT EL PASO

Business Automation, July 1967, p 30-35

Description of a computer system in use at a Texas retail organization. The system is used to control stock, calculate availability of goods on the basis of their movement history, and print purchase orders and simultaneously prepare tags to be attached to the merchandise when it is received. Also, the NRC "control" cash registers capture sales data on machine language optical tape which is used in a tape-oriented 315 computer, extending the EDP facility to the sales floor.

173

THE CLASH OF NEW MARKETING INSIGHTS WITH OLD MYTHOLOGIES

Leo Burnett

"Chicago Marketing Man of the Year" Award Dinner, Chicago, Ill , Feb 11, 1966, Paper 23 p 9 refs

Examination of five fallacies in the marketing field. The first is that people in the marketing field understand it best and know what the customer wants. Second, it is commonly thought that the largest share of an existing market is to be preferred to creating new markets. Third, competition is often felt to be a closed system where everyone offers the same products and services. The fourth fallacy is that marketing should be based on present income, and the fifth, that specialists provide the best basis for marketing decisions. All these fallacies are challenged, and it is recommended that marketing be pursued as a social rather than a physical science.

174

HOW TO BUILD A MARKETING INFORMATION SYSTEM.

Donald F Cox and Robert E Good

Harvard Business Review, vol 45, May-June 1967, p 145-154

Discussion of marketing information system (MIS) development. An MIS is defined as a set of procedures and methods for the regular, planned collection, analysis, and presentation of information for use in making marketing decisions. The article is concerned with the development of three types of marketing operating systems - those designed for control, for planning, and for basic research.

175

THE EMERGENCE OF MARKETING SYSTEMS

Donald F Dixon

Economic and Business Bulletin, vol 17, June 1965, p 1-8

Explanation of the emergence of the marketing channel. Contemporary marketing theory involves the analogy between marketing behavior and an ecological system. The concept of a system involves organization and a series of interrelated input-output activities.

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directed toward some recognized goal. The purpose of the paper is to derive an answer to the question of how such a system may come into being and persist, starting from traditional economic and administrative theory, rather than working within the conceptual framework of marketing per se.

176

THE PRODUCT MANAGER'S JOB

Gordon H. Evans

New York, American Management Association (AMA Research Study 69), 1964 102 p

Outline of the development of the product manager. Thirty years ago he served as an advertising specialist, marketing assistant, or applications specialist. Today he is often a high-level planner or coordinator with greater responsibility. The paper describes his duties, defines the limits of his authority, and projects his future prospects. The product manager system is an advanced marketing approach that can operate effectively within any kind of management organization.

177

MARKETING SYSTEMS AN INTRODUCTORY ANALYSIS

George Fisk

New York, Harper and Row, 1967 797 p

This book analyzes marketing systems by establishing a general framework common to all organized social systems, in which the economics of equalization, the strategy and mechanics of modern management, and the social consequences of marketing management can be interrelated. Household and business spending behavior, the organization of marketing channels and unit channel flows, marketing activities, the constraints imposed on decisions by competition and the Government, and social welfare and economic efficiency are discussed.

178

ADVERTISING A PROBLEM IN INDUSTRIAL DYNAMICS

Jay W. Forrester

Harvard Business Review, vol 37, Mar -Apr 1959, p 100-110

Discussion of advertising and industrial dynamics problems, including such matters as the time and scope relationships of advertising to other company functions, the aims and nature of advertising research, and the relationship of the agency to the company client. To overcome these problems, it is noted that management should systemize its evaluation of advertising and develop an overall program.

179

THE ROLE OF THE BRAND MANAGER IN CONSUMER PACKAGED GOODS COMPANIES

Joseph N. Fry

Stanford, Calif., Stanford University, Graduate School of Business (Stanford Sloan Program Report), Aug 1963 58 p 44 refs

Results of a study of the development and use of the brand manager concept in consumer packaged goods companies. The concept represents a significant departure from the more traditional organization system by delegating primary responsibility for planning and coordinating marketing activities to product or brand managers.

180

IMPROVED MARKETING ANALYSIS OF PROFITABILITY, RELEVANT COSTS, AND LIFE CYCLES

Sam R. Goodman

Financial Executive, June 1967, p 28-34

Analysis of three problems responsible for the failure of management accounting to meet the reporting challenge presented

by the product manager concept in marketing organization. The literature of financial management through the past years shows a decided orientation of the profession toward seeking improvement in the measurement reporting and analysis of cost considerations as they pertain to manufacturing. This implies a change in the role of the accounting executive, who becomes a part of an overall marketing team that includes purchasing, manufacturing, and brand people as well. The team provides an efficient working mechanism for improved marketing analysis of profitability, relevant costs, and life cycles.

181

IMPACT-OF-GOVERNMENT UPON-THE-MARKET-SYSTEM

E. T. Grether and Robert J. Holloway

Journal of Marketing, vol 31, Apr 1967, p 1-5, Commentary, Seymour Banks, p 5-7

Suggestions for research on the impact of governmental policies, programs, and regulations on (1) the functioning of the market system as a whole and (2) specific subsystems. Government intervention at all levels has been pointed out as one the most significant environmental forces affecting marketing.

182

THE MARKET SYSTEM

Robert H. Haveman and Kenyon A. Knopf

New York, John Wiley and Sons, Inc., 1966 223 p

The system of price and market direction in a market-directed economic system is discussed in this book. The issues of what to produce, how, and for whom are analyzed with a nonmathematical model. The household and the competitive business firm are examined as decision-making units buying and selling labor, resources, and goods. The problems of economic power, irrationality, and nonmarketable goods in a real economy are examined.

183

MARKETING SMOOTHES TRAFFIC FLOW AT WESTINGHOUSE DIVISION

W. K. Hoge

Industrial Marketing, Feb 1967, p 90

Solution of a serious order problem through unconventional organization. By placing the traffic department under the marketing division, the Westinghouse Corp.'s Small Motor Div. has affected a cost reduction expected to reach \$50,000 annually and has substantially speeded delivery of customer orders.

184

HOW SYSTEMS SELLING IS REVOLUTIONIZING MARKETING

Business Management, June 1967, p 60 ff

Case histories of systems selling, illustrating the effects of the approach on organizations adopting it. Companies that reversed a losing streak by adopting systems selling see it as the only way to growth. Like the total marketing concept that it implements, systems selling modifies every aspect of a firm's activities and simplifies management decisions on acquisitions, licenses, and joint ventures.

185

A NEW CONCEPT IN INVENTORY CONTROL FOR RETAILERS

Harvey E. Kapnick, Jr. and David B. Hertz

National Retail Merchants Association, Retail Research Institute Annual Conference 2nd, San Francisco, Calif., Feb 10, 1960, Paper, 16 p

Discussion of inventory control and management. An inventory control system has been developed and found to provide retailers with the best inventory information to enable them to set realistic performance objectives and manage and control their inventories of style items to realize the most from their merchandising skills.

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The system uses historical performance to provide criteria for judging current information which yields effective inventory management on an item-by-item basis

186

PRODUCT DESIGN, MARKETING, AND MANUFACTURING INNOVATION

D W Karger and R G Murdick

California Management Review, vol 9, no 2, Winter 1966, p. 33-42

Discussion of ways to achieve product differentiation through design, marketing, and manufacturing. Product planning should be directed toward innovation in product design, marketing programs, and manufacturing processes. If each of these is considered as a vector, degrees of change along these vectors should be defined so that management can select an appropriate strategy

187

DIAGNOSING THE MARKETING TAKEOVER

Philip Kotler

Harvard Business Review, vol 43, Nov -Dec 1965, p 70-72

Presentation of the case for coordinating company actions that affect the customer. However, it is pointed out that disturbing organizational conflicts between other departments and marketing can result from trying to achieve this coordination

188

THE SYSTEMS APPROACH TO MARKETING

William Lazer and Eugene J Kelley

IN MANAGERIAL MARKETING PERSPECTIVES AND VIEW-POINTS (Revised Edition)

Edited by William Lazer and E J Kelley

Homewood, Ill, Richard D Irwin, Inc, 1962, p 191-198

Investigation of whether the systems approach is a useful and realistic approach to marketing management. The acceptance of the marketing management philosophy implies the adoption of a systems perspective in making marketing decisions. A systems overview offers an objective frame of reference for solving problems. The components and characteristics of marketing systems are discussed. The marketing management use of the systems model requires new levels of understanding of the interaction among the flows of information, material, money, manpower, space, capital, equipment, and markets and of how the marketing system depends on the interaction among the goods and service, communications, and physical distribution mixes

189

THE SYSTEMS CONCEPT IN MARKETING

William Lazer

Adapted from a presentation to the American Marketing Association June 1962 6 p

Discussion of the application of systems analysis to marketing management. Marketing institutions are viewed as dynamic systems for modeling purposes. In integrating all components into a system, the coordination of subsystems in total systems and the linkages between independent systems in supersystems must be considered. There are linkages connecting marketing to the business environment and linkages within a company. The systems approach helps a marketing or business system achieve an overall goal. Some benefits resulting from the application of systems thinking to marketing are mentioned briefly, and three future developments are noted

190

OPERATIONS RESEARCH IN MAKING MARKETING DECISIONS

John F Magee

Journal of Marketing, vol 25, Oct 1960, p 18-23

Discussion of the value of operations research in making marketing decisions. The systems concept, the emphasis on experimentation, and the search for consumer action models are the three main contributions of operations research to marketing

191

MAXIMISING THE MIX

Andrew Muir

Management Today, July 1967, p 96-100

Description of how to prune the product range regularly and profitably with discrimination and with scientific techniques. One sign of a progressive company is that it is constantly extending its product range, but there is a limit to the number of lines that a company can afford to carry

192

THE SOCIAL CONTEXT OF ECONOMIC CHOICE IN A SMALL SOCIETY

Manning Nash

Man, vol 61, 1961, p 186-191

Detailed discussion of the economy of peasant Indians in the State of Chiapas, Mexico. The economics of a small or primitive society can be very dependent on its social organization. It is shown how various leveling mechanisms inhibit economic expansion and limit maximization, thereby reducing to nil any interest in technological or social innovation. These direct economic levelers rely on certain social features, but there are also some social actions which operate indirectly, such as witchcraft

193

THE PRODUCT MANAGER SYSTEM

New York, National Industrial Conference Board (Experiences in Marketing Management, No 8), 1965 126 p

Consideration of the product manager concept, a development in modern marketing that affects substantially both the organization and management of marketing operations. Suggestions of marketing executives who had first-hand experience in making optimum use of this organizational approach are presented

194

FINANCIAL MANAGEMENT OF THE MARKETING FUNCTION

Michael Schiff and Martin Mellman

New York, Financial Executives Research Foundation, 1962 262 p

This book examines and evaluates the practices of a selected group of companies in the analysis and control of marketing costs. The organization of marketing departments is discussed. The process of setting sales and profit objectives is examined, as is the measurement of marketing performance. The administration of the field sales organization is discussed. Some problem areas in marketing administration are the sales and profit objectives, distribution channels, product administration, field sales administration, physical distribution, and marketing research administration

195

SALES FORECASTING WITH THE AID OF A HUMAN BEHAVIOR SIMULATOR

George Schussel

Institute of Management Sciences, Journal, vol 13, June 1967, p B-593 to B-611

S3 SPECIFIC FUNCTIONS

196
Description of a recent application of simulation to the problem of forecasting. Simulation of the human behavior characteristics of a diverse group of retail dealers was used to propose and test a new method of forecasting a manufacturer's sales to his retail dealers. Results indicate that effective simulation of the human decision processes of a large nonhomogeneous group of businessmen is possible.

WHY PRODUCTS FLOURISH HERE, FIZZLE THERE

Montrose Sommers and Jerome Kernan
Columbia Journal of World Business, vol 2, Mar -Apr 1967,
p 89-97 14 refs

Discussion of means and ways of expanding into new cultural markets. Expansion may involve the use of either the same product-same promotion, same product-different promotion, different product-same promotion, or different product-different promotion strategy. Culture is one reason why some products flourish while others do not. The life style of a particular group of people bears heavily on their buying decisions. A combination of old and new products and old and new methods of promotion is thought to be best for successful expansion.

BUSINESS MANAGEMENT AS A TOTAL SYSTEM OF ACTION AND THE ROLE OF MARKETING

Thomas A Staudt
IN MANAGERIAL MARKETING PERSPECTIVES AND VIEW-POINTS (Revised Edition)

Edited by William Lazer and E J Kelley
Homewood, Ill , Richard D Irwin, Inc , 1962, p 198-204

Study of business management and the role of marketing. Business is viewed as a goal-directed system in which the objectives of the firm determine manpower, materials, machines, and financial commitments in operating systems. The strategy and tactics of the firm should be market-oriented since the market holds veto power over all other activities in the system.

INTEGRATING THE INDIVIDUAL PROGRAMS IN MARKETING PLANNING A SYSTEMS APPROACH

M E Stern
New York, McGraw-Hill Book Co , Inc , 1966, p 105-122

Description of a method for selecting the most efficient marketing strategies and setting forth special selection criteria. The basis for selecting particular marketing strategies and making specific resource allocations is the total effect that these strategies and allocations have upon a firm's overall marketing activities. These interactions necessitate the integration of the individual programs. Model-building, total systems design, and computer simulation comprise a general method of aggregating individual models into an interacting system.

TO COMPETE, BUSINESS MUST DEVELOP MARKETING INTELLIGENCE SYSTEMS

Eugene Telser
Marketing Today, vol 5, no 2, 1967 3 p

Discussion of the application of Marketing Intelligence Systems (MIS) to new product development programs and marketing activities. The systems approach serves the most important task of marketing management - ensuring the future health of the individual business, and the economy and nation as a whole, by keeping pace or, even better, staying ahead of the changing world.

200

PLANNING TOMORROW TODAY THROUGH SUCCESSIVE FOCUSING

E Peter Ward

Journal of Marketing, vol 31, July 1967, p. 23-27

Proposal of a procedure for the continuous coordination of a business firm with its environment. The process, successive focusing, involves stages during which a company's field of view is narrowed so that it can direct its attention to opportunities for exploiting its resources and potentials. The stages are (1) analysis, (2) exploration, (3) search, (4) acquisition, (5) evaluation, and (6) action.

201

THE PROMISE OF SIMULATION IN MARKETING

Harold Weitz

Journal of Marketing, vol 31, July 1967, p 28-33 9 refs

Discussion of the potential of simulation - present and future. Simulation, as a technique, has been increasingly applied to a wide spectrum of marketing problems, both theoretical and practical. The major advantage and stimulant to the use of simulation in marketing lies in its ability to deal with complex, dynamic, and interacting phenomena that characterize marketing. If the processes or phenomena permit adequate description, they can be modeled and experiments can be simulated. Simulation models, by avoiding oversimplification, tend to be better descriptions of reality.

202

WHAT'S HAPPENED TO SELLING SYSTEMS?

Marketing Forum, June 1966, p 22-25

Discussion of the concept of systems selling, a result of the increasingly complex technology affecting business and industry. Systems selling has imparted new meaning into marketing complex installations. It emphasizes customer solutions, rather than hardware, and so requires a different kind of selling and a different kind of seller. Some people believe it can revolutionize marketing, but, most important, management believes it can increase profits.

203

FULL-LINE VS SPECIALIZATION I - WHERE IS TECHNOLOGY PUSHING THE INDUSTRIAL SALESMAN? II - THE MAN FROM GENERAL ELECTRIC'S ECSO SELLS EVERYTHING

Marketing Forum, Jan 1967, p 17-24

Consideration of the question of whether to use full-line or specialist salesmen in marketing. Advantages and disadvantages of both are pointed out. The basic issues are explained, and examples of solutions used in three specific areas are presented. General Electric Co 's out-sized pooled sales unit which provides a salesman with more than 200 lines is discussed extensively.

204

MATHEMATICS FOR PRODUCTION SCHEDULING

Melvin Anshen, Charles C Holt, Franco Modigliani, John F Muth, and Herbert A Simon

Harvard Business Review, vol 36, Mar -Apr 1958, p 51-58

Application of mathematical techniques to management decisions concerning production scheduling and employment, stressing cost functions and components. A set of decision rules aimed at taking the guesswork out of the decision process and improving efficiency is given.

205

BEATING THE UP-AND-DOWN CYCLE

Business Week, Oct 19, 1963, p 90-96

Discussion of the methods employed by the Cincinnati Milling Machine Co to avoid the up-and-down cycle inherent to any capital goods sales. This has been accomplished by having the company follow a gradual policy of diversification into other fields, such as electronics and plastics, thus succeeding in smoothing the fluctuations in its profits.

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206

MODERN PRODUCTION MANAGEMENT

Elwood S. Buffa

New York, John Wiley and Sons, Inc., 1961 636 p

The new and traditional methods of analyzing production management concepts are discussed in this book. These include cost data determinations, graphic methods, statistical analysis, mathematical models, simulation and linear programming. The design of production systems covers automation, job design, process planning, plant location, and layout. Finally, production system operation and control are studied, including inventories, maintenance, quality control, labor costs, improvements, and transitions. These are all related to management problems and decision-making in production.

207

THE PROJECT MANAGER

Paul O. Caddis

Harvard Business Review, vol. 37, May-June 1959, p. 89-97

Detailed analysis of a project manager for advanced technology. A project manager is defined as the individual responsible for the creation of a product, and his functions are discussed, including qualifications in the advanced technology environment, working knowledge of various fields of science, understanding of management problems, and active interest in training and teaching. Also discussed are his autonomy, authority, and responsibility, and the risks and organization planning involved. Finally, the communication problem is investigated, and the project manager's role in the future is assessed.

208

INTEGRATING PROCESS AND BUSINESS CONTROL

James C. Hammerton

Business Automation, Apr 1967, p. 35-39

Description of the role of a business information system - to collect information on routine activity in the organization and to disseminate responses to this information. The history of the process control computer is detailed. The function of the computer in integrating process control and business control is discussed.

209

PRODUCTION MANAGEMENT AND MANUFACTURING SYSTEMS

Thomas R. Hoffmann

Belmont, Calif., Wadsworth Publishing Co., 1967 355 p

This basic textbook is concerned with production management and manufacturing systems. The systems concept is traced from the industrial revolution to the present. Organizational behavior, the decision process, and mathematical modeling in modern management are studied. The importance of product research and development and motion and time study is stressed. Traditional management topics such as capital investment, plant location and layout, materials handling, quality standards and control, maintenance, inventory control, etc. are included.

210

PLANNING PRODUCTION, INVENTORIES, AND WORK FORCE

Charles C. Holt, Franco Modigliani, John F. Muth, and Herbert A. Simon

Englewood Cliffs, N.J., Prentice-Hall, Inc., 1960 419 p

This book describes the development and application of mathematical techniques to business decision-making. These techniques improve the control of operations and reduce the cost of making routine decisions and provide managers with more information and time for long-range planning and for solving nonroutine problems. Key factors involved in efficient production planning and systems control are analyzed.

211

PRODUCTION OUTLOOK

Business Week, June 17, 1967, p. 65

Brief summary of the production outlook, noting new trends. Mass production is slowly giving way to flexible production as customers are demanding more variety and quality in the products they buy. Examples from the automobile and automated machine tools industries are given, showing the hundreds of models that come off the assembly lines. This trend will affect the factory concepts, the relation between labor and costs, and the manufacturing executives who have to learn the skills of the computer technology.

212

GRINDING - A STUDY IN MANUFACTURING PROCESS RESEARCH

Paul Rosenthal

Research Trends, Spring-Summer 1967, p. 10-15 7 refs

Research supported by the Abrasive Grain Association, the Grinding Wheel Institute, and the Carborundum Co.

Analysis of the grinding process, with reference to grinding wheel failures, emphasizing the relationship of input parameters (such as the abrasive) to output variables (such as surface finish). Further study is necessary before the process can be completely understood.

213

HOW MANAGERS USE INDUSTRIAL DYNAMICS

Kenneth J. Schlayer

Industrial Management Review, vol. 6, no. 1, Fall 1964, p. 21-29

5 refs

Study of industrial dynamics, presenting three case histories. Emphasis is placed on the construction and application of a specific mathematical model for each of the three cases, and implementation and results are discussed. Decision-making, data collection and analysis, costs, profitability, and human problems are investigated in some detail.

214

MAKING PROJECT MANAGEMENT WORK

John M. Stewart

Business Horizons, vol. 8, no. 3, Fall 1965, p. 54-68

Investigation of project management. The scope, unfamiliarity, and complexity of a project management organization are discussed, and special trouble sources are analyzed. These include interfunctional problems, organizational problems, top management mistakes, and the human problems. Several guidelines are given for executive action.

215

CHANGING THE FACTORY

Morris Tanenbaum

International Science and Technology, June 1967, p. 56-66

Study of manufacturing technology and the possibilities of bringing it in line with the conception and design of new products. It is pointed out that, while technological advances since World War II have been phenomenal, the manufacturing processes have advanced little or not at all. Some guidelines for the introduction of modern technology into the factory are given, with stress on numerical control, information transmission, computerized billing, recording, etc.

216

THE CONCEPT OF A PRODUCTION SYSTEM

Philip H. Thurston

Harvard Business Review, vol. 41, Nov-Dec 1963, p. 70, 75, folding chart

Illustration, by means of a chart, of the concept of a production system. The three basic elements shown are product design,

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process design, and material flow. The various factors appearing in production systems are identified, and the interrelationships between these factors and various parts of the production process are shown. It is stressed that the production system should be related to other systems of business, such as finance and marketing. Feedback is considered important, also.

217

"SYSTEMS" CONCEPT LETS ONE PRESS DO WORK OF SIX
Vearl A. Williams

Production, Apr 1966, p 120, 121

Detailed description of a new press installed in one of the Westinghouse factories. It is shown how planning, user-builder coordination, preproduction engineering, and the systems concept helped speed up the installation of the huge press so that continuous production was assured. The operations and functions of the machine-tool are summarized.

218

THE RESEARCH AND DEVELOPMENT PORK BARREL

Philip H. Abelson

Science, vol 149, July 2, 1965, p 11

Brief discussion of the distribution of Federal funds and contracts for research and development. Current distribution illustrates the possibilities for economic stimulus and the role of science and technology in changing modern civilization. However, the unevenness of the distribution may be producing economic disparities with serious consequences for the overall economy. Over-concentration in some regions is resulting in an inability of other regions to employ scientists; the latter regions have trained at great expense. It appears that such long-term effects are becoming a national political issue.

219

TIME ALLOCATION AMONG THREE TECHNICAL INFORMATION CHANNELS BY R&D ENGINEERS

Thomas J. Allen, Maurice P. Andrien, Jr., and Arthur Gerstenfeld
Massachusetts Institute of Technology, Alfred P. Sloan School of Management, Working Paper No 184-66, Apr 1966 24 p 5 refs.
Grant No. NaNsg 235-62, NSF Grants No. GN-233, No. GN-353

Analysis of time allocation among technical information channels by R&D engineers. A series of single and matched pairs of projects is presented. Discussed are (1) the percentage of time spent in three information-gathering activities as a function of the phase of the project, (2) the relation of time allocation patterns to performance, and (3) the correlation between the degree of uncertainty in a subsystem and the amount of information-gathering devoted to that subsystem. The various teams that did the information-gathering are evaluated, and recommendations are made for maximum performance.

220

OPERATIONS RESEARCH IN RESEARCH AND DEVELOPMENT, PROCEEDINGS OF A CONFERENCE, CASE INSTITUTE OF TECHNOLOGY, CLEVELAND, OHIO, 1962

Edited by B. V. Dean

New York, John Wiley and Sons, Inc. 1963 289 p

This collection of papers on R&D management systems problems serves as a useful text and reference for problems associated with the utilization of corporate and laboratory research resources and control of specific development projects. Emphasis is placed on the effective use and control of technical resources. The book demonstrates how to use Operations Research (OR) in a specific system and how to solve research management problems. Specific case studies are provided.

221

3M'S FORMULA FOR NEW PRODUCTS

Thomas R. Brooks

Dun's Review and Modern Industry, Aug 1963, p 32 ff

Analysis of the Minnesota Mining and Manufacturing Co.'s R&D programs. The principles of profitable research are discussed. Factors of importance are a large budget, an information flow program, and the free-time concept. Some current projects are described, and a short history of 3M is given.

222

CHANGE AHEAD FOR LABS

Business Week, Apr 4, 1964, p 92, 94

Discussion of R&D programs in the chemical industry. The pressure of automation on R&D programs to develop new products is discussed. CPI cost-profit squeeze effects on R&D budgets are noted.

223

UNDERSTANDING PROJECT AUTHORITY REQUIRES STUDY OF ITS ENVIRONMENT

David I. Cleland

Aerospace Management, vol 2, no 1, 1967, p 5-13 11 refs

Discussion of the dependence of project manager authority on project environment. The project concept and the hierarchy structure are examined. A chart comparing the functional and project viewpoints is given, and the conflict between the project manager and the functional managers is discussed.

224

WHY PROJECT MANAGEMENT?

David I. Cleland

Business Horizons, Winter 1964, p 81-88

Project management rationale and history. The responsibilities and authority of the project manager are discussed. Department of Defense project management is described as an example.

225

CORPORATIONS STRESS RESEARCH RESULTS

Douglas W. Cray

New York Times (Business Section), Aug 8, 1965, p 1 ff

Study of R&D expenditure trends in industry and government. The decrease in expenditure growth is discussed.

226

THOUGHTS ON ORGANIC CHEMICAL RESEARCH IN INDUSTRY.

William von E. Doering

Synthetic Organic Chemical Manufacturers Association of the United States, Meeting, New York, N.Y., Oct 13, 1966, Paper 6 p

Discussion of the purpose of research in the chemical industry - to develop or improve new commercial systems. The problem-solver concept is advocated. Research management and the application of modern organic chemical theory are considered.

227

GETTING MAXIMUM RETURN FROM RESEARCH EXPENDITURES
Gerald J. Fuchs and G. Clark Thompson

Conference Board Business Record, vol 18, Apr 1961, p 2-10

Description of research personnel evaluation techniques to get maximum return from research expenditures. Various personnel appraisal forms are given, and the research environment is discussed. It is found that research budgeting techniques and control are important for effective maximization of work effectiveness.

228

THE STRATEGY OF CORPORATE RESEARCH AND DEVELOPMENT

R. E. Gibson

California Management Review, vol 9, no 1, Fall 1966, p 33-42

Discussion of R&D optimization. The effects of geopolitical, social technological, and economic environments are felt by

S3 SPECIFIC FUNCTIONS

R&D programs A flow diagram of R&D processes is given and discussed

229

BASIC RESEARCH IN INDUSTRY

J E Goldman

International Science and Technology, Dec 1964, p 38-42, 44, 46

Reasons for basic research in industry Research is becoming a very important source of management personnel The principles of research management are explained with the analogy of a poker game The atmosphere for research is an important factor

230

BELL LABS' 230 LONG-RANGE PLANNERS

Morton M Hunt

Fortune, May 1954, p 120-123, 129, 130, 134, 136

History of Bell Laboratory long-range planning Direct dialing (1910), network color television (1930), and long distance direct dialing (1933) were some results Management decisions to exploit these developments before their success was demonstrated are examined Self-repairing telephone systems, televisphones, and automatic telephone answering machines are slated for the future

231

WINDS OF CHANGE IN INDUSTRIAL CHEMICAL

David M Kiefer

C & EN, Mar 23, 1964, p 88-109

Study of R&D trends in the chemical product industry A slow-down in research expenditures is in progress Several rating formulas for research projects are given Mathematic modeling as a technique is discussed Other aspects of technical management are also covered

232

HOW TO SET UP A PROJECT ORGANIZATION

C J Middleton

Harvard Business Review, vol 45, Mar -Apr 1967, p 73-82

Outline of project organization establishment procedures Product definition, task and funds control, make-or-buy decisions, scheduling, project status, identification and solution of problems, project change control, associate or subcontract control, customer and public relations, and market potentials control are required for product design-development effort Task management and personnel recruitment problems for the project organization are discussed The effects of project organization on a company are examined

233

NATIONAL REPORT - THE SCIENCE ENTREPRENEUR

Industrial Research, Feb 1967 2 p

Discussion of the scientific entrepreneur phenomenon The motivations, original capital source, and early developmental work are examined Various entrepreneur aid groups have been organized

234

THINK TANKS

Richard Reeves.

New York Times, June 16, 1967, p 31

Study of the impact of "think tanks" - centers of research and thought - on American life The industrial research company, Arthur D Little, Inc, planned the establishment of the General Motors Research Laboratories and the Battelle Memorial Institute Management consulting now accounts for half the company's revenue Operation Bootstrap, radar signal noise elimination, iron ore

refining with natural gas, and fiberglass are some of its later projects Industrial research companies in general are discussed Sociotechnological problems are now of great interest to the "think tanks"

235

RESEARCH OUTLOOK WHERE THE R&D FUNDS ARE HEADED

Business Week, Nov 12, 1966, p 109-112

Consideration of which type of research support is best to encourage innovation It is found that Federal R&D funding is leveling off Basic research is still going up, while development is dragging Tables breaking down expenditures for various sciences from 1958 to 1967 are given

236

RESEARCH PROGRAM ON THE ORGANIZATION AND MANAGEMENT OF R&D

Massachusetts Institute of Technology, Alfred P Sloan School of Management, Semi-annual Progress Report, Working Paper No 78-64, June 30, 1964 28 p

Discussion of 15 research projects in the research program on the organization and management of R&D These projects range from mathematical modeling to studies on the impact of R&D on the economy

237

FACTS AND FOLKLORE IN RESEARCH AND DEVELOPMENT MANAGEMENT

Edward B Roberts

Cambridge, Mass, Massachusetts Institute of Technology, Alfred P Sloan School of Management, 1967 33 p 23 refs Grant No NSG-235

Investigation of three R&D areas illustrating that the management of R&D is based largely on fads and folklore The facts in all three cases suggest that desirable management practices lie in directions opposite to current trends Real decisions are made in a more direct fashion than would appear from the formal procedures, technical information is communicated most effectively from person to person, with the technical transfers influenced by factors alien to present computer-based approaches Each of the several government contracting trends considered appears to lead to lessened R&D performance than its most obvious alternative To change all these, a new role is suggested for graduate schools of management

238

RESEARCH & DEVELOPMENT POLICY-MAKING

Edward B Roberts

Technology Review, vol 66, June 1964, p 3-7

Presentation of computer simulation techniques for R&D policy-making The effects of conservatism and low bidding are discussed extensively Typical research project life cycles are shown in graphs

239

TOWARD A NEW THEORY FOR RESEARCH AND DEVELOPMENT

Edward B Roberts

Industrial Management Review, vol 4, no 1, Fall 1962, p 29-40 13 refs

Research supported by the Ford Foundation

Discussion of the main problems in R&D management - high failure rate for new product efforts, rapid obsolescence of weapon systems, product requirement complexity increase, and high costs and poor performance Organizational problems and managerial attitudes discourage the understanding of R&D The systems approach to R&D theory is discussed

240

PARALLEL AND SEQUENTIAL STRATEGIES FOR R&D PROJECTS
 Richard S Rosenbloom and William J Abernathy
Harvard University, Graduate School of Business Administration,
Final Report, Jan 1967 135 p 33 refs
 Contract No Nonr-1866(54), NR 277-030, NSF Grant No GP-2723

Discussion of the project manager's problem of deciding when to use or continue a parallel strategy. Results of actual projects and digital simulation of a model appropriate to the structure of the decision as faced in practice are given. Information requirements for a sound choice between parallel and sequential strategies are identified, and the consequence of choosing a strategy on the basis of incomplete information is noted. The feasibility of collecting the requisite economic data in actual projects is demonstrated

241

PROJECT MANAGEMENT AND THE ROLE OF THE PROJECT MANAGER

Irwin M Rubin
Massachusetts Institute of Technology, Alfred P Sloan School of Management, Working Paper No 333-66, Oct 1966 17 p 6 refs
 Grant No NsG-235

Study of the relationship of a project manager's background characteristics to the characteristics of projects he manages. Project manager traits and project characteristics are related to project performance

242

QUANTITATIVE STUDIES IN RESEARCH AND DEVELOPMENT MANAGEMENT

Marshall C Yovits
Science, vol 155, Feb 17, 1967, p 901, 902

Application of quantitative techniques and analysis methods to R&D management. The use of mathematical models to allocate R&D funds is noted. Parallel and sequential strategies, research communication, and dynamics of R&D organizations are discussed

243

A BASIC MARKETING INFORMATION SYSTEM - A CASE STUDY IN THE ECONOMICAL USE OF COMPUTERIZED MANAGEMENT INFORMATION SYSTEMS

Arnold E Amstutz
American Marketing Association, Meeting, Dallas, Tex, June 16, 1964, Paper 27 p

Description of a simple, totally integrated information processing and control system developed for a small company introducing a new product into a difficult-to-define market. The design, structure, and operating characteristics are discussed. Sales report generation, advertising media performance evaluations, automatic follow-up letter writing, customer characteristic specification, and marketing cost analyses are some uses of the system

244

DISTINGUISHING CHARACTERISTICS OF MANAGEMENT CONTROL SYSTEMS

R N Anthony
Harvard Business School, BC 256R, n d 14 p

Description of management control systems - a category of Planning and Control Systems - and their characteristics. Management control systems are compared to the processes of strategic planning, technical control, financial accounting, and information handling. The guidelines for management control are derived from strategic planning, and management control sets the guidelines for technical control. The characteristics of these processes are also described, and some of the consequences of confusing management with these processes are discussed

245

AUTOMATION IT WON'T HELP EVERYBODY

Time, Jan 26, 1959, p 84

Examples of the pitfalls of automation to those unprepared for it. The use of computers for management decision-making and inventory control is discussed

246

BAPTISM OF FIRE FOR COMPUTERS

Business Week, Apr 22, 1967, p 128-130, 135, 136

Examination of the use by the Department of Defense of computers in the field. The Seventh Army computer system is described. The supply and personnel computer system of the Army and Marine Corps in Vietnam is part of the one extending back through Saigon, Okinawa, and Hawaii. The future use of computers to integrate and process fire control data in the field is discussed. The use of computers in tactical operations is being tested by the Seventh Army. Various other tactical uses by the USAF and the Navy are described

247

HOW TO INSTALL A MANAGEMENT INFORMATION AND CONTROL SYSTEM

Joseph I Barnett
Systems and Procedures Journal, Sept -Oct 1966, p 10-14

Requirements for the design and installation of management information and control systems. A modified program evaluation and review technique (PERT) chart is given to be used for planning and control of installation

248

MANAGEMENT ACCOUNTING IN THE AGE OF SYSTEMS

John A Beckett
NAA Bulletin, vol 45, Apr 1964, p 3-10

Consideration of managerial accounting and the systems concept. The presystem era and the history of the systems concept are discussed. Military systems, such as the Strategic Air Command and various weapon systems, are cited as examples of total systems

249

SYSTEMS CONTRACTING A NEW WAY TO REDUCE PURCHASING COSTS

Ralph A Bolton
Management Review, May 1967, p. 25-32

Presentation of systems contracting methods to reduce purchasing costs of low-value, high-use supplies. The traditional approach is shown to be expensive and inefficient. The working of the systems contracting technique and its advantages are discussed.

250

EDP COORDINATES RETAIL OPERATIONS

John G Bradley
Systems, Mar 1967, p 12-14, 34 ff

Examination of the computer coordination of retail operations at Rich's department store in Atlanta, Ga. Data acquisitions at the cash register, microfilm, and optical scanning are some of the techniques used. Sales information is captured and locked into the system at the point of sales, improving the accuracy of the reports. Electronic processing handles large volumes of data at high speed, thereby improving the timeliness of the reports. The electronic system has the capacity to absorb a greater workload so that adjustments can be made to keep the reports as informative as management requires.

S3 SPECIFIC FUNCTIONS

251

THE BROKER'S FASTEST MESSENGERS

Business Week, Oct 10, 1964, p 83, 84, 86

Discussion of electronic units that display stock market data to brokers at their desks. These computer-centered systems supply stock brokers with more trading data at a much faster pace. Various hardware is described. Some future developments are discussed.

252

CONTROL SYSTEMS

Gordon S Brown and Donald P Campbell

IN AUTOMATIC CONTROL

New York, Simon and Schuster, 1955, p 26-40

Study of feedback control systems engineering in modern industrial America. The governor at the power station, process controllers in the chemical products industry, and the American communication system are cited as examples of feedback control systems. Future developments are discussed.

253

MANAGEMENT WILL NEVER BE THE SAME AGAIN

Gilbert Burck

IN GUIDE TO THE QUANTITATIVE AGE

Edited by D F Mulvihill

New York, Holt, Rinehart and Winston, 1966, p 156-170.

Discussion of the relationship of management to computers. Through numerous examples, the role of the machine in planning and decision-making and in some of the lower-echelon fields is detailed, with stress on what effects computers can have on top and middle management.

254

DATA AND THE SYSTEM.

Frederick J Burke

American Statistical Association and Chicago Association of Commerce and Industry, Annual Midwest Conference on Statistics for Decision, 13th, Chicago, Ill., Apr 1, 1966, Paper 5 p

Discussion of data flow in information systems. Personnel training is found to be an integral component in systems installation procedures.

255

INFORMATION TECHNOLOGY & DECENTRALIZATION

John F Burlingame

Harvard Business Review, vol 39, Nov-Dec 1961, p 121-126

Defense of corporate decentralization against arguments that contemporary and future information technology developments render decentralized organizations outmoded. It is concluded that information technology makes decentralized decision-making both feasible and desirable.

256

NEW DECISION-MAKING TOOLS FOR MANAGERS

Edited by E C Bursk and J F Chapman

Cambridge, Mass., Harvard University Press, 1963 413 p

This book describes the new decision-making tools for managers. Operations research, mathematical programming, planning and controlling with the program evaluation and review technique (PERT), cost analysis, econometrics, mathematical modeling, and product strategy developments are some of the topics covered. Examples of putting theory into practice are given.

257

A WAY OF CONTROLLING ENGINEERING PROJECTS

J L Church, Jr and R E Carpenter

NAA Bulletin, June 1958, p. 45-55

Highlights of an engineering project control plan used at the Electrodata Div. of the Burroughs Corp. Cost, quality, and time control are achieved with this system. The system design is given, and various report forms are shown.

258

CAN WE INTEGRATE SYSTEMS WITHOUT INTEGRATING MANAGEMENT?

William J Crowley

Data Management, Aug 1966, p 14-18, 23, 24

Study of management integration, a direct consequence of systems integration. The major management revolutions of the twentieth century, the concept of management by exception, and the office mechanization following World War I are discussed. Operational, tactical, and strategic control are the three kinds of management decisions. The use of hypothetical models in management leads to computer utilization.

259

MANAGEMENT INFORMATION CRISIS

D Ronald Daniel

Harvard Business Review, vol 39, Sept-Oct 1961, p 111-121

6 refs

Discussion of organizational problems of various companies to show the appearance of the management information crisis. Environmental, competitive, and internal information are the three basic information types that are necessary for management planning.

260

DATA COMMUNICATIONS IMPROVES FOOD INDUSTRY PROFIT MARGINS

Systems, Mar 1967, p 16-18

Proof that data communications systems can improve profit margins in the food industry. A supermarket order cycle and distributor purchase order cycles are shown to illustrate the workings of the system.

261

PROFIT GROWTH VIA INFORMATION SYSTEMS

Neal J Dean

Business Automation, May 1963, p 20-25

Basic factors placing increasing demands on corporate information systems. Included are (1) the growth of business, (2) the increasing expenditures of new product development, (3) an increase in key executive positions numerically, (4) an increase of foreign business, and (5) the increasing complexity of top management planning. The advantages of using an integrated approach are that total data processing is accomplished at the lowest unit cost and information is maintained in a single steady stream, ensuring greater accuracy.

262

CAN MANAGEMENT INFORMATION BE AUTOMATED?

John Dearden

Harvard Business Review, vol 42, Mar-Apr 1964, p 128-135

Determination of the feasibility of automating management information for the higher levels of management activity. Strategic planning, management control, and operational control are discussed. It is concluded that management control and strategic

53 SPECIFIC FUNCTIONS

planning information cannot be automated effectively, but that operational control problem information can be. Production scheduling and inventory control are some examples

263 HOW TO ORGANIZE INFORMATION SYSTEMS

John Dearden

Harvard Business Review, vol 43, Mar -Apr 1965, p 65-73
Problems in organizing information systems. The misapplication of computers is discussed. Systems development is broken into three stages - systems specification, data processing implementation, and programming

264 MYTH OF REAL-TIME MANAGEMENT INFORMATION

John Dearden

Harvard Business Review, vol 44, May-June 1966, p 123-132
Presentation of three fallacies of the real-time management information system - the improved control, scientific management, and logistics similarity fallacies. The management function is discussed. The differences between real-time systems and conventional systems are detailed

265 PREPARING FOR THE MANAGEMENT INFORMATION SYSTEM

E R Dickey, Jr
The Office, Feb 1967, p 49-52

Chart showing the dynamics of management information systems. The ideal system will collect, validate, process and react, store, retrieve, and report all significant operational and behavioral information. Computers will not impinge on the analysis and policy-making functions, but will eliminate the largest portion of the supervisory function

266 AUTOMATION THE ADVENT OF THE AUTOMATIC FACTORY

John Diebold

Princeton, N J , D Van Nostrand Co , Inc , 1952 181 p
The purpose of this book is to describe the problems connected with adapting to automatic production and to show what benefits can be gained from studying the problems systematically. The economic and social effects of developments in electronics, their applications in industry, and their limitations and potentials are examined

267 THE FIRST NATIONAL BANK'S ON-LINE SAVINGS SYSTEM

Richard E Dooley

American Statistical Association and Chicago Association of Commerce and Industry, Annual Midwest Conference on Statistics for Decisions, 13th, Chicago, Ill , Apr 1, 1966, Paper 31 p

Description of the on-line computer system of the First National Bank of Chicago. The programming for the system involved 16 men at various times, 9 5 man years, and 100 programs (40 for basic operations) generated

268 MASTER PLAN FOR INFORMATION SYSTEMS

Marshall K Evans and Lou R Hague

Harvard Business Review, vol 40, Jan -Feb 1962, p 92-103
Presentation of the five-step master plan to improve information systems. The five steps are to establish long-range goals, define the current system, make short-range improvements, determine time and responsibility, and accomplish the plan

269

FDA USING COMPUTER TO SET UP SYSTEM TO CHECK ON NARCOTICS AND ADVERSE REACTION TO DRUGS

Business Week, Aug 19, 1967, p 60

Description of the use by the Food and Drug Administration of an IBM 360 Model 30 computer. The computer keeps track of adverse reactions to drugs and monitors abuses of narcotics and psychedelic drug compounds. The system is also used to check on companies and individuals handling controlled drugs

270

MANAGEMENT'S VITAL ROLE IN BUSINESS SYSTEMS

A Fendrock

Systems, Jan 1966, p 28-32

Discussion of managerial problems in business systems. Executive leadership, management controls, operating management involvement, computer systems management, and staff factors play a role in the success or failure of computer installations. The executive leadership factor is stressed

271

SEVEN DEADLY DANGERS IN EDP

L R Flock, Jr

Harvard Business Review, vol 40, May-June 1962, p 88-96

Pitfalls in setting up electronic data processing (EDP) systems. They are (1) poor procurement, (2) ignorance of procedures, (3) service process over control, (4) middle management resistance, (5) inadequate staff, (6) poor staff location, and (7) faulty evaluations. A successful system must have definite goals, competent organization, and delineation of responsibilities

272

MANAGEMENT INFORMATION SYSTEMS AND THE COMPUTER

James D Gallagher

New York, American Management Association (AMA Research Study Series No 51), 1961 191 p

This book is concerned with the impact of computers on management information systems. Sylvan Electric Products and American Airlines systems are taken as case studies. Three broad conditions indispensable in setting up management information systems are outlined. A successful data processing installation must be coordinated with sound financial planning and economic evaluation to obtain an adequate return on the investment made. The master plan must include the participation of top management as well as the operating executives. The data processing department and systems should be planned, organized, directed, and controlled in a professional manner

273

TOP MANAGEMENT AND COMPUTER PROFITS

John T Garrity

Harvard Business Review, vol 41, July-Aug 1963, p 3 ff

Comparative survey of a number of companies extensively using computer systems, discussing the role of top management in obtaining maximum profits. Some of the areas covered include (1) quality of executive leadership, (2) soundness of planning and control tools used, (3) caliber of the computer system technical staff, and (4) equipment strategy. A series of flaws in managerial thinking is pointed out, including fear of the new technology, bad use of the machine, or use of junior, irresponsible management personnel. It is suggested that top management be used much more than at present

274

GETTING THE MOST OUT OF YOUR COMPUTER - A SURVEY OF COMPANY APPROACHES AND RESULTS

New York, McKinsey and Co , 1963 20 p

S3 SPECIFIC FUNCTIONS

Results of a survey of 27 companies using computer systems extensively. The results computers can produce and the factors contributing to beneficial results are noted. In companies which use computers, cost savings can recover start-up costs and current outlays and even cover outlays for new applications. Also, customer service can be improved and manufacturing time reduced. Successful computer efforts were made in companies putting computer-based systems into broad use. The major factors in getting payout were the patterns of management and organization of the computer systems effort.

275

REMARKS OF GORDON L. HAMRICK

Gordon L. Hamrict

American Bankers Association, Department of Automation and Marketing Research, National Automation Conference, New York, N.Y., July 14, 1964, Paper 12 p

Lecture on the need for a management information system for banks due to recent and rapid technological changes. It is shown that only an automated system will be able to bridge the gap between the flood of information and its digestion, and details are given on organization, planning, execution, and control of such systems. Finally, an analysis is made of the economic benefits for the bank using the system, noting its practicality.

276

MANAGEMENT CONTROL SYSTEMS CASES AND READINGS

Robert N. Anthony, John Dearden, and Richard F. Vancil

Homewood, Ill., Richard D. Irwin, Inc., 1965 686 p

This text on management control systems is principally concerned with the control of managed costs, with profit centers, and with capital acquisitions rather than with the more familiar areas of standard costs and flexible budgets. Specific chapters include readings on organizational relationships, information systems, responsibility centers, managed costs, profit planning, transfer pricing, investment centers, long range planning, and capital budgeting. Detailed case histories are given.

277

REAL-TIME BUSINESS SYSTEMS

Robert V. Head

New York, Holt, Rinehart and Winston, Inc., 1964 368 p

The basic theme of the book is how to make a commercial data processing system operational. All phases of real-time systems are described, with details on the principles and methods that apply to computer installation, including such techniques as simulation and the critical path method. Although programming and system implementation are emphasized, equipment and systems design considerations are covered thoroughly.

278

DEVELOPING A COMPUTERIZED MANAGEMENT INFORMATION SYSTEM

David B. Hertz

Management Review, Apr 1966, p 61-64

Development of a computerized management information system, including the evolution of computers from invoicing to estimation of uncertainties in the introduction of a new product. In order for the chief executive to understand the computer-generated data, four steps are recommended: (1) development of a master plan and a time table for teaching his organization to apply computer data to decision-making problems, (2) use of top talent, (3) initiation of a program of experimentation, development, and installation, and (4) establishment of meaningful objectives.

279

MERCHANDISING INFORMATION SYSTEMS

Paul R. Hildebrandt

American Statistical Association and Chicago Association of Commerce and Industry, Annual Midwest Conference on Statistics for Decision, 13th, Chicago, Ill., Apr 1, 1966, Paper 17 p

Consideration of the evolution of merchandising information systems, including three overlapping phases: (1) substitution of computers for manual or punched card systems, (2) hardware evolution in input, displays, integration of functions, etc., and (3) use of computers as management tools for statistics, simulation, etc., based on integrated data. With the growing use of computers the goal of having the right goods in right quantities at the right time and cost is not far off.

280

MANAGEMENT INFORMATION SYSTEMS AND THE INFORMATION SPECIALIST, PROCEEDINGS OF A SYMPOSIUM, PURDUE UNIVERSITY, LAFAYETTE, IND., JULY 12, 13, 1965

Symposium sponsored by the Krannert Graduate School of Industrial Administration and the University Libraries

Edited by J. M. Houkes

Lafayette, Ind., Krannert Graduate School of Industrial Administration and the University Libraries, 1966 138 p

Consideration of the techniques of information and documentation and their current and future potentials. The use of documentation to management is clarified. The role of the information specialist and the modification of the role of librarians in government and industry due to the use of computers in documentation are discussed. Included in the discussions are the business information systems concept, government information announcement and dissemination, and technology and the government statistics program.

281

THE INSURANCE MAN'S BEST FRIEND

Business Week, Nov 7, 1964, p 100, 102, 104

Role of computers in the insurance business. Details are given on programming the computers for billing, statistics, dividend calculation, and connections between agencies and the home office. Also mentioned are the cost savings achieved and the human problems encountered.

282

PERFORMANCE MEASURES FOR INFORMATION SYSTEMS IN THE TRANSPORTATION INDUSTRY

William S. Jones

American Statistical Association and Chicago Association of Commerce and Industry, Annual Midwest Conference on Statistics for Decision, 13th, Chicago, Ill., Apr 1, 1966, Paper 18 p

Study of the improvement in information handling in transportation through use of computers. Four cases from the air, highway, and rail industries are discussed in detail, stressing a series of performance measures including costs, accuracy, time, reliability, security, efficiency, acceptance, etc.

283

KEEPING TAGS ON INVENTORY

Business Automation, Apr 1967, p 57-59

Discussion of the use of computers in warehouse inventory processing to speed up operations, storage, and movement of items and to avoid errors between the master file in the main office and the de facto situation in the warehouse. Details on the data handling of some 10,000 items in a large company are given, the basis of the system being a series of coded record cards.

284

A DESIGN FOR THE FIRM'S MARKETING NERVE CENTER
Philip Kotler

Business Horizons, vol 9, no 3, Fall 1966, p 63-74 7 refs
Blueprint for an organizational unit to improve the accuracy, timeliness, and comprehensiveness of executive marketing information services. Labelled marketing information and analysis center (MIAC), the unit makes extensive use of computers and, besides providing information, aids executives in analytical and decision actions. It is exclusively user-oriented. The information problems arising from data disappearance, delay, or distortion are discussed together with sources and flow of marketing intelligence

285

MANAGEMENT AND ENGINEERING INFORMATION SYSTEMS
Arthur A Kusnick

Industrial Management Review, Spring 1966, p 3-16
Fundamental information requirements for serving complex operations in developmental/manufacturing organizations, including a discussion of data processing techniques. Implementation of automated information systems, systems design, information requirements, product definition and operational planning, and control are examined in detail, and useful diagrams are included

286

NEVER OVERESTIMATE THE POWER OF A COMPUTER
Ralph F Lewis

Harvard Business Review, vol 35, Sept -Oct 1957, p 77-84
Assessment of business applications of electronic computer systems including motives, cost savings, data processing, needs, integration of operations, and installation. Various recommendations of practical importance are noted

287

OPERATIONS RESEARCH AND THE COMPUTER IN AN AREA SURVEY

A C Maas

Food Technology, Dec 1962, p 19-24

Illustration of the use of mathematical methods of linear programming to simulate alternative plans and generate information for long-range planning. Characteristics peculiar to the vegetable-canning industry bearing directly on the construction of the model that simulates the production and marketing process are given. The marketing plan is considered the basic reference point in the analysis, as it determines how the production complex will be organized and operated

288

THE OHIO BELL BUSINESS INFORMATION SYSTEM
E. K McCoy

IN AMERICAN FEDERATION OF INFORMATION PROCESSING SOCIETIES, SPRING JOINT COMPUTER CONFERENCE, ATLANTIC CITY, N J, APRIL 18-20, 1967, PROCEEDINGS
Washington, D C, Thompson Book Co (AFIPS Conference Proceedings Volume 30), London, Academic Press, Ltd, 1967, p 433-439

General description of the Business Information System of the Ohio Bell Telephone Co. Emphasis is on the handling of customer requests for service, or, as they are more commonly called, customer service orders. The information system was designed not only for management purposes, but also as a tool for the clerk, analyst, service representative, information operator, plant installer, and others. The method of operation, implementation, and data processing functions and equipment are described

289

CAUTION - CRASH COMPUTER CONVERSION
John D MacLean

Systems and Procedures Journal, Jan.-Feb 1967, p 8-11
Consideration of the risks involved in undertaking a crash computer conversion. The risks are due to such errors as management belief that the change involved is minimal, cost savings fallacies, or promise of quick delivery of the installation, etc. Steps required to prevent these errors, including a feasibility study, a detailed systems design, programming and testing, and systems changeover, are noted

290

INSTALLING AND USING AN AUTOMATIC DATA PROCESSING SYSTEM A CASE STUDY FOR MANAGEMENT

John Peter McNamee
Boston, Harvard University, Graduate School of Business Administration, Div of Research, 1961 315 p

This book is concerned with the development and use of data processing systems from the standpoint of business management, specifically with the need for and more effective use of equipment in managing basic business operations such as decision-making and control systems. Information systems at medium-sized manufacturing company are analyzed, providing a specific illustration of the systems approach to business. The development of the company's principal management and control systems is traced, with emphasis on the nature of the company and its need for and use of information in relation to the characteristics of data-handling methods. The problems of installation and use of both automatic and punched card systems are discussed, and the role of management in guiding the development of such systems is stressed

291

MANAGEMENT INFORMATION SYSTEMS I - COMPUTERS AND INFORMATION SYSTEMS

Harvard Business School, IA 1135-1, 1964 22 p

Discussion of the business uses of computers in technical information systems, management information systems, and routine data processing systems. It is noted that digital computers are used to a greater extent in business than analog computers

292

A REAL-TIME MANAGEMENT INFORMATION SYSTEM
Paul G Margaritis

Data Management, May 1966, p 44-47

Discussion of management information systems real-time operation, including data retrieval by general or segregated activity, control file, and logical records

293

THE EMERGING PHILOSOPHY OF SYSTEMS MANAGEMENT

George M Muschamp

Data Management, Oct 1964, p 34-37.

Discussion of systems management, with emphasis on automatic control and engineering management. Costs, digital-to-analog instrumentation, and importance of feedback engineering are also mentioned in some detail, noting the emergence of a new type of manager, the generalist, who will direct the design of management systems, linking together management and the economic domain

294

THE COMING REVOLUTION IN BANKING

Anthony G Oettinger

American Bankers Association, Department of Automation and Marketing Research, National Automation Conference, New York, N Y, July 13, 1964, Paper 8 p

S3 SPECIFIC FUNCTIONS

Investigation of the effects of automation and computers on the foundations of the banking system. The most important aspects are manipulation, storage, and transmission of information. However, this is not merely a technical and operating matter for lowering the cost-to-work ratio. Banking can be looked upon as a fiduciary financial information system, handling and exchanging data and information.

295

ON-LINE SAVINGS SYSTEM

Chicago, Ill., The First National Bank of Chicago, 1964 3 p

Description of the On-Line Savings System of the First National Bank of Chicago. This electronic data processing technique for savings accounts makes available to each teller the speed, information storage capacity, and accuracy of an entire computer system. All entries in the passbook of a depositor are made by machine. Other abilities of the system, such as off-line operation, are mentioned.

296

MANAGEMENT ORGANIZATION AND THE COMPUTER PROCEEDINGS OF A MCKINSEY FOUNDATION SEMINAR, UNIVERSITY OF CHICAGO, CHICAGO, ILL, FEBRUARY 1959
Edited by G P Shultz and T L Whsler
Chicago, University of Chicago, Graduate School of Business, 1960 257 p

The book consists of articles that discuss the impact of computerization on business organizations by examining the histories of companies such as Standard Oil of New Jersey, United Air Lines, General Electric, Atwood Vacuum Machine Co., and the International Shoe Co. Management problems and accompanying stresses and strains, new channels of information, and shifts in decision-making responsibility are examined in detail by authorities in management, administration, operations analysis, industrial relations, and psychology.

297

THE PENTAGON BUILDS A MONSTER

Business Week, Feb 18, 1967, p 198, 199

Review of the proliferation of management systems in the Department of Defense. These include contract definition, performance evaluation and review techniques, value engineering, cost information reports, configuration management, contract funds status report, maintenance management, quality program requirements, systems engineering, and other, less well known management systems. Due to overlapping and conflict, it is questioned whether the present system is the most cost-effective. The quagmire of regulations and reporting requirements seriously affects subcontractors and small suppliers.

298

POLAROID'S ENLARGED DISTRIBUTION PICTURE

Traffic Management, vol 6, Feb 1967, p 51-54

Solutions of physical distribution problems at the Polaroid Corp. A control tower was established, from which the total activity of several distribution centers can be supervised. Through computerized operations and graphs, charts, and tables, the complete integration of traffic, inventory, shipping, etc., is obtained. Details are given concerning the operation of the computer.

299

THE SCOPE AND OBJECTIVES OF UNIFIED OPERATIONS

Arnold O Putnam

Data Management, Mar 1964, p 26-30

Outline of unified operations management (UOM). UOM envisions the company as a whole and considers the impact of decisions on overall company profits. The basic requirements

include (1) the recognition of the effects of decisions on other parts of the business, (2) profit planning based on effective cost accounting, and (3) an information flow system with feedback.

300

THE INFORMATION UTILITY

Lee L Selwyn

Industrial Management Review, Spring 1966, p 17-26 10 refs
Contract No Nonr-4102(01)

Discussion of the use of a centralized time-sharing computer system facility as an information service or information utility. The advantages of such a facility are listed, and the various services available to scientific and business users are described. The use of either consoles or communication lines, according to the requirements of the user, to communicate with the computer is noted, and the cost of services and the cost of sharing are determined.

301

A NEW WAY TO CUT COSTS

Harvey N Shycon

Greater Boston Business, Jan 1957, p 20, 21, 26

Application of operations research to the solution of management problems and cost-reduction. Inventories, warehousing, distribution, sales, production methods, office procedures, personnel assignment, scheduling, financial control for investment, and planning equipment and facilities for future needs are some of the problems which can be successfully analyzed by operations research methods.

302

ELECTRONICS AND BOOKS THE MERGER PATH CONTINUES TO WIDEN - TECHNOLOGY STIRS SEARCH FOR PROFITS

William D Smith

New York Times, Feb 6, 1966, p 1F, 14F

Description of the merging of electronic data processing and publishing. The merger is a result of need and a technological capability to solve the problem. Publishers are information sources, and computers are information handlers. The first application of this technique is automatic typesetting for printing. Two possible new industries are programmed education and the information utility concept for storing and retrieving information. The latter is basically an automated publishing house, of which medicine, science, and finance will probably be the first users.

303

MANAGEMENT LOOKS AT TOTAL SYSTEMS

William M Smith

Data Management, June 1965, p 64-66

Discussion of total management information systems and determination of their applications and limitations. Basically, management information is objective, internal information, and this determines its use in solving problems and making decisions. Consequently, care must be exercised in using management techniques, such as program evaluation and review techniques, wherever subjective or external information is involved. Because of the personal aspects of managing, management information is many times most useful as a guideline. The relation between the above and current attitudes is pointed out.

304

MANAGEMENT USES OF THE COMPUTER

Irving I. Solomon and Laurence O. Weingart

New York, Harper and Row, 1966 225 p

This practical handbook is addressed to business executives who must evaluate the advantages computers can offer their companies. Use of the computer in the context of business data processing is explained, and the feasibility study, a method of analyzing

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current business practices and information processing in the area being considered for conversion to computer processing, is examined. The application of the feasibility study in selecting the appropriate computer and computer systems and the problems of conversion to computer usage and management's responsibility in maintaining the usefulness of the computer are discussed

305

THE BROWSING ERA
Richard E Sprague

Business Automation, June 1967, p 53-55, 70

Examination of the use of on-line real-time management information systems by executives to make decisions and solve problems. Current and historical data can be retrieved in a short time by direct communication with a computer. The development of the so-called top-down systems design is described. Finally, the incorporation of rapid simulation, model building, and profitability accounting into such systems in order to compare alternatives is predicted

306

INFORMATION SYSTEMS IN MANAGEMENT SCIENCE
Harry Stern

Management Science, vol 13, Apr 1967, p B-540 to B-542

Brief discussion of information systems and the application of computers in business management. Computer techniques relate to the responsibility of management science to provide management with valid quantitative data for making decisions. Three important aspects are noted - the accounting system which forms the model of the business, the validity and suitability of data, and the evaluation of management science techniques used in areas of subjective judgment. Other problems associated with information systems in management science are listed

307

SWEDEN PLANS COMPUTER HOOKUP OF ALL BANKS WITH THE STOCKHOLM STOCK EXCHANGE

Business Week, Apr 22, 1967, p 158

Presentation of a plan for establishing a centralized computer system for communication among all of the banks of Sweden and the Stockholm Stock Exchange. A computer would issue and transfer stocks and bonds, print shares and stockholder lists, register changes in investor holdings, issue dividend checks, and transfer funds between accounts. Public inspection of ownership would be facilitated by the system. Similar systems are already under way in Norway and Finland

308

WHO SHOULD CONTROL INFORMATION SYSTEMS?

Philip H Thurston

Harvard Business Review, vol 40, Nov -Dec 1962, p 135-139

Review of the responsibility for and control of information systems in a company. A change from past policy is recommended. In the past it was the specialists who initiated a systems change, and as a result, they tended to assume responsibility. However, it is felt that if an operating manager is given the responsibility and control, he will obtain a better result because he knows the existing operation, understands the objectives and can relate the system to the needs, and has the ability and organizational position to work with operating people to effect the change. With the specialist exercising his skills under the operating manager, the important advantages he possesses are best utilized

309

AUTOMATIZED INFORMATION SYSTEMS IN PLANNING, CONTROL AND COMMAND

Andrew Vazsonyi

Management Science, vol 11, Feb 1965, p B-2 to B-41

Discussion of the status of information systems in planning, control, and command with emphasis on automated information systems. Some problems that can be solved with the aid of automation are briefly mentioned. On-line real-time information systems, space travel control, airline reservations, military command and control, R&D planning and control, computer applications, problem-solving, man-machine communication consoles, solution of mathematical equations, computer-aided engineering design, program evaluation and review techniques, and automated language teaching are discussed. It is suggested that the best solution will come from a balanced man-machine partnership

310

FUTURE INVESTMENT FOR FOOTBALL THE DATA BANK

John Noble Wilford

New York Times, Dec 1, 1966, p 64

Proposal that systems analysis and a computerized data bank be used as aids in coaching football. By making use of the role of a player, the opponent capabilities and other factors affecting the outcome of a play and the game, plays, and game strategy could be planned and evaluated. Then, on the basis of a postgame analysis of the performance of the team, players could be shifted or replaced and the plays or strategy changed where necessary. This approach was successful at the high school level and could find its best use at the professional football level

311

HOW THE TOTAL INFORMATION SYSTEM IS DESIGNED

Harold B Wilson

The Office, Feb 1967, p 53-55

Explanation of the design of a total information system. The evolution of the total information system concept from the systems analysis of processing is described. The integration of subsystems to improve operations is an intermediate step. Today, the management scientist examines all the end products of a total system and then examines the inputs required to produce all the necessary end products. The minimum input needed is determined and the required processing, computer-oriented where feasible, is designed. Only operating practices outside the integrated data processing system are analyzed

312

TOWARD INTELLIGENT MANAGEMENT INFORMATION SYSTEMS

Zenon S Zannetos

Massachusetts Institute of Technology, Alfred P Sloan School of Management, Working Paper No 155-65, 1965 31 p 9 refs

Description of the design of an intelligent management information system for facilitating the managerial planning and control activities of a firm. The approach is based on the activities that management should perform, rather than on attempts to improve existing systems. After planning, control, and replanning activities are listed, the acquisition of intelligence in information systems is examined at various levels of sophistication. For the final steps in developing intelligent management information systems, a review is given of probabilistic information for operating process control and associative information for planning process control

313

PACKAGING - A SYSTEMS APPROACH

Albert A Nelson

American Marketing Association, 1967 International Marketing Conference, Toronto, Canada, June 22, 1967, Paper 9 p

Application of the systems approach to marketing and packaging. Factors for packaging, such as machinery, graphic design, channels of distribution, and handling, and factors for marketing research are discussed. These factors include market surveillance, distribution analysis, management, advertising, and such intangibles as prediction of market changes

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314

INDUSTRIAL PACKAGING - THE SYSTEM IS THE SALE

R H Lafontaine

American Marketing Association, 1967 International Marketing Congress, Toronto, Canada, June 22, 1967, Paper 13 p

Discussion of industrial packaging, including details on systems, materials, and manufacturing processes. Cost problems and the influence of gamma radiation on food packaging protection are mentioned. Examples of packaging systems for products as varied as motor oil and fresh flowers are given. Also, ways of handling passenger luggage in the era of the jumbo jets of the 1970s are recommended.

315

HONEYWELL'S \$60-MILLION QUESTION

Business Week, June 3, 1967, p 40

Discussion of a dispute among major computer manufacturers over a USAF multimillion dollar contract. The dispute involves cost and antitrust problems.

316

THE PACKAGE AS A COMMUNICATION

Burleigh B Gardner

American Marketing Association, 1967 International Marketing Congress, Toronto, Canada, June 22, 1967, Paper 5 p

Discussion of the package as a communication link between customer and product. Various factors influencing the decision to buy are discussed - e.g., color, form, material, performance, and manufacturing feasibility. The influence that these factors have in setting up favorable reactions in the mind of the potential customer are investigated. Some practical recommendations are given.

317

THE PACKAGING SYSTEM - A CASE HISTORY

Robert L Esse

American Marketing Association, 1967 International Marketing Congress, Toronto, Canada, June 22, 1967, Paper 9 p

Case history of the problems involved in packaging a perishable product. Details on the design of the container, including material selection, lining, easy opening, and reclosure are given, together with data on cost estimates, equipment, and tests.

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318

NEW PATTERNS FOR OVERSEAS OPERATIONS

Gilbert H Clee and Franklin A Lindsay

Harvard Business Review, vol 39, Jan - Feb 1961, p 65-73

Discussion of the systems management concept of economic development for international or overseas operation. Approaches to the problem in the Free World and in Communist countries are compared, with details on the hypothetical planning and programming of a U.S.-sponsored project for a South American country. Financial and marketing manpower plans are outlined, noting advantages and progress attainable.

319

FLUOR'S FAST WAY TO GROW

Management Today, July 1967, p 88-91

Discussion of the operations of the English subsidiary of the Fluor Corp. of Los Angeles, which is involved in building expensive chemical plants around the world. Problems of salesmanship, decentralization and centralization, financing, personnel welfare, management, etc. are analyzed. It is concluded that in the long range fast growth is a major factor for success.

320

GREECE GOVERNMENT BY SUB-CONTRACT

The Economist, June 3, 1967, p 1039, 1040

Presentation of the details of a contract between Litton Industries and the Greek government for development of parts of the island of Crete and the Western Peloponnesus for tourism and its connected prospects in economic development. Possibilities that might be expected for Litton Industries on the home market following the experience acquired in Greece are discussed.

321

GREECE WILL HIRE U.S. MANAGEMENT

New York Times, Mar 20, 1966

Brief discussion on the decision of the Greek government to hire Litton Industries to economically develop parts of Greece. It is emphasized that the reasons for contracting a U.S. firm are the slow pace of Greek bureaucracy and American management efficiency, stressing, however, that the Americans will only propose and manage, while ultimate decisions will rest with the Greek government. Financial details are included.

322

FOREIGN AID AS A PROBLEM OF RESOURCE MANAGEMENT
THE CASE OF FREE CHINA

Neil H Jacoby

California Management Review, vol 9, no 1, Fall 1966, p 3-10

Discussion of U.S. foreign aid as a problem of resource management, with details on the case of aid to Taiwan. The article covers the machinery of foreign aid, government relations with various state and international agencies, and relations with private industry, and sets forth seven criteria, including target attainment, development strategy, project selection, administrative policy, etc., which were successfully applied to obtain the projected GNP three years in advance of the proposed date. Financial and statistical percentages are quoted, and a summary of the strategy and recommendations to be followed for other cases is given.

323

BUSINESS ENTERPRISE IN A GLOBAL CONTEXT

Endel J Kolde

California Management Review, vol 8, no 4, Summer 1966, p 31-48

Detailed discussion of business enterprise in a global context. Foreign trade is discussed in the context of the world as divided in three fictitious parts - the industrial West, the Communist East, and the subindustrial South. Government policies in relation to international organizations, free enterprise principles vs. communistic criteria, and multinational fusion are analyzed separately and as international factors, together with the effects on international trade.

324

LITTON MAKES A DEAL WITH ATHENS

Business Week, June 17, 1967, p 132

Details on a contract between Litton Industries and the Greek government, concerning economic development of Crete and the Western Peloponnesus region. Financial problems, especially the possible difficulty of finding the necessary capital, are discussed.

325

JOINT VENTURES OR TRANSNATIONAL BUSINESS

Richard D Robinson

Industrial Management Review, Fall 1964, p 59-65

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Discussion of advantages, disadvantages, and real possibilities for joint ventures or transnational business. Multinational business is defined, and factors such as time, product variety, geographical limitations, environment, government acceptability, financing, legal problems, and nationalistic bias are analyzed. The need for the schools of management to take these problems into consideration is stressed.

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326

THE APPLICATION OF SYSTEMS ANALYSIS TO GOVERNMENT OPERATIONS

Guy Black

Washington, D C, Executive Office of the President, Council of Economic Advisers (Draft Manuscript), Dec 24, 1965 42 p 25 refs

Application of systems analysis to Government operations, especially to cost effectiveness analysis and planning in the planning, programming and budgeting systems. Outlines are given of systems analysis, systems engineering, and systems management, and the four major phases of systems analysis are discussed in detail. These are (1) stating the objectives, (2) constructing a model, (3) establishing relationships among benefits, costs, and characteristics of systems, and (4) determining an optimum. Data requirements are briefly discussed. The relation of the systems approach to program budgeting and program packaging is established. Sub-optimization is also discussed.

327

THE LEGISLATIVE BRANCH GRASPS THE SYSTEMS APPROACH

Robert L. Chartrand

Washington, D C, American Association for the Advancement of Science, Paper, Dec 27, 1966 26 p 30 refs

General discussion of the application of systems analysis and operations research to various activities of the legislative, executive, and judicial branches of the Federal government. It is suggested that information systems, automatic data processing, program evaluation techniques, and other successful management methods can aid policy planning, resource allocation, and other decision-making tasks in determining the Federal budget and managing programs. It is pointed out that the systems approach offers a long-range solution to many large, complex public and civilian problems.

328

THE SYSTEMS APPROACH A TOOL FOR THE CONGRESS

Robert L. Chartrand

Washington, D C, Library of Congress, Legislative Reference Service (TL 6565C, SP 126), Mar 9, 1967 27 p. 38 refs

Consideration of the systems approach as a tool for Congress. Automatic data processing is one improvement advocated to alleviate the overloaded work schedule of the Congress and its office staff.

329

A NEW PLANNING-PROGRAMMING-BUDGETING SYSTEM FOR THE FEDERAL GOVERNMENT

Gerhard Colm

Looking Ahead, vol 14, June 1966, p 6, 7

Discussion of the adoption of a planning, programming, and budgeting system for the Federal government. The system accomplishes tasks quicker, more effectively, and with less costs, and offers more accurate information for decision-making judgments. Cost-benefit analyses and cost effectiveness are the major tools. At the start of the program there was a problem in implementing the system - namely, a lack of qualified personnel. In addition, in the attempt to determine national goals, only Federal government agencies were considered and only budget costs calculated. Yet state, local, and private activities relate to national goals, and manpower and material resources in the economy are also national costs.

330

OPERATIONS RESEARCH IN BRANCHES OF THE GOVERNMENT

W E Cushman

Science, vol 155, Feb 17, 1967, p 898-901

Brief account of the findings of a symposium on the application of operations research, systems analysis, and other problem-solving methods to Federal government planning and public expenditures. Health systems are noted, including health programs, production line physical examinations, and clinical decision-making. An incomplete account is given of quantitative studies of R&D management problems.

331

THE CALIFORNIA EDUCATIONAL INFORMATION SYSTEM

Alvin Grossman

Datamation, Mar 1967, p 32-37

Description of the California educational information system, which was designed to solve data processing problems. The basis of the system is the concept of regional centers serving geographical areas. Educational data are collected, related, and processed. Audit and management reports for educational planning can be generated by the inclusion of uniform business accounting procedures, information concerning professional personnel, and facts relating to instructional materials and equipment in the system.

332

THE SCOPE OF MANAGEMENT INFORMATION SYSTEMS IN GOVERNMENTAL ADMINISTRATION

Edward F R Hearle

IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES

Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration

Edited by S B Sweeney and J C Charlesworth

Philadelphia, American Academy of Political and Social Science, 1967, p 197-208

Study of the use of management information systems in government administration. Future added capabilities of computer technology will provide for optical character reading input, printed, vocal, or graphic output, ultimate information storage, and substantially increased processing speeds. More environmental data will be readily available, environment and agency internal operations will be automatically monitored, and the information flow may bypass middle management. Interagency information systems will expand rapidly because many agencies share the same environment, all levels of government can share data if they are standardized, and equipment can be shared to lower costs.

333

PROGRAM BUDGET FOR NATURAL RESOURCES ACTIVITIES

W Z Hirsch

RAND Corp, Memorandum RM-4513-RC, June 1965 43 p 13 refs

Consideration of the application of program budgeting to natural resources activities. Federal natural resources activities and objectives and the natural resources program budget proposed for the 1963 fiscal year are discussed. After a detailed benefit-cost analysis, some administrative and institutional arrangements for effective implementation of allocation decisions are given so that conflicts can be avoided.

334

TOWARD FEDERAL PROGRAM BUDGETING

Werner Z. Hirsch

Public Administration Review, vol 26, Dec 1966, p 259-269

15 refs

Examination of the use of program budgeting in the Federal government. Program budgeting permits planning and management functions and facilitates decision-making for tradeoffs and resource allocation. Cost-benefit analysis, or cost effectiveness, is the major evaluation tool. Some of the effects on administrative organization are noted. The 1965 budget is discussed, with

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emphasis on the military and educational subprograms. Problems and other aspects of implementing program budgeting are covered

335

AUTOMATION, SYSTEMS ENGINEERING, AND PUBLIC ADMINISTRATION: OBSERVATIONS AND REFLECTIONS ON THE CALIFORNIA EXPERIENCE

Ida R. Hoss

Public Administration Review, vol 26, Dec 1966, p 311-319
22 refs

Analysis of the use of automatic data processing, systems engineering, and operations research in policy planning and decision-making, based on experiments made in California. There appear to be definite bureaucratic problems associated with both the vertical and horizontal organization of public administrations which can directly affect communication and information systems. In addition, there are legal complications. Sometimes more than one decision-maker is involved, and there are conflicting goals. It is noted that automation has serious consequences in the areas of hiring, firing, training, retraining, skills, and careers. It is pointed out that many social science factors cannot be ignored.

336

AUTOMATION IN STATE & LOCAL GOVERNMENTS

Dennis G. Price

Datamation, Mar 1967, p 22-25

Investigation of the use of electronic data processing and information systems, in state and local governments, to deal with problems and coordinate and integrate programs. Although size is a drawback, there is a definite need for both statewide federated information systems for joint state-local programs and vertical programs with much improved organization. Standardized data elements and codes and educational curricula for training personnel are also necessary.

337

CONGRESSIONAL INTEREST IN SYSTEMS APPROACH SPURS LEGISLATION FOR NATIONAL COMMISSION

Hugh Scott

Aerospace Management, vol 1, no 3, Fall/Winter, p 11-13

Short review of legislation proposing a commission to study the application of the systems approach to the solution of non-defense public problems. It is felt that systems management techniques and systems analysis can be useful in such areas as housing, air pollution, water consumption, air traffic, surface transportation, education, health, law enforcement, and government organization. An assessment of the relation between public and private enterprises and the role of universities is suggested.

338

McNAMARA'S MANAGEMENT REVOLUTION

Daniel Selgman

Fortune, July 1965, p 117-120, 246, 248, 250

Discussion of the techniques introduced by Secretary of Defense McNamara to solve management problems in the Department of Defense. In addition to the planning, programming, and budgeting system, McNamara centralized, and to some extent reorganized, most activities, eliminating some and adding new ones. He saw his role as more than administration and judgment and felt that management involved matters of objectives and alternatives, too. The relation of budget-making to research, development, and engineering and to resources is noted.

339

THIS CRIMINOLOGIST IS DEVELOPING A NEW WAY TO CATCH A THIEF

The Atlantic, vol 220, July 1967, p 62

Description of the use of computers in law enforcement agencies. It is shown how police reports are relayed to a central computer

which releases in seconds information on stolen goods, criminal records, etc. This way a patrolman can get an answer to his inquiry soon enough to follow a "hot" lead.

340

PLANNING, PROGRAMMING AND BUDGETING SYSTEM

Washington, D C, The United States Post Office Department (POD Publication 94), Dec 1966 19 p

Description of the application of the planning, programming, and budgeting system (PPBS) management technique to the improvement of the efficiency and effectiveness of the U.S. Post Office. PPBS presents alternative programs, allows analysis of performance, determines the cost of various actions, and applies formal planning and analysis to budget decisions. It relates outputs to inputs. The eight major activities of the Post Office Department are described. An operating budget is derived from a Program and Financial Plan.

341

PLANNING IN THE UNITED STATES POST OFFICE DEPARTMENT

Washington, D C, The United States Post Office Department,

Office of Planning and Systems Analysis (POD Publication 101),

Feb 1967 26 p

General description of some problems of the U.S. Post Office Department and the planning being done for future operations. Figures of growth are given, and mention is made of the application of systems analysis and of the planning, programming, and budgeting system (PPBS) to help solve the problems.

342

WIPING OUT ASP SYSTEM

Business Week, June 17, 1967, p 131

Short notice on trade legislation submitted to Congress, calling for the repeal of the American Selling Price (ASP) system of assessing duties on certain imported synthetic organic chemicals as part of the Kennedy Round tariff cuts discussions.

343

TECHNOLOGY AND CONTROL OF CRIME

Dael Wolfe

Science, vol 156, June 30, 1967 1 p

Discussion of the technology and control of crime. Statistical data and some of the recommendations made by the Institute for Defense Analyses (IDA) to the President's Commission on Law Enforcement (including central police command and control system, quicker data processing, better equipment, and a systems analysis of police operations and court procedures in order to better the operations) are given. The involvement of the IDA in domestic problems is explained.

344

COMPUTER APPLICATIONS IN MEDICAL COMMUNICATION AND INFORMATION RETRIEVAL SYSTEMS AS RELATED TO THE IMPROVEMENT OF PATIENT CARE AND THE MEDICAL RECORD (REPORT TO THE COMPUTER RESEARCH STUDY SECTION, RESEARCH GRANTS REVIEW BRANCH, DIVISION OF RESEARCH GRANTS, NATIONAL INSTITUTES OF HEALTH)

Boston, Massachusetts General Hospital, Laboratory of Computer Science, Sept 26, 1966 75 p 64 refs

Review of the application of the computer to medical communication and information retrieval systems and to improving patient care and medical records. The information processing needs and problems for patient care and medical records, which require computers, are described. The importance of keeping in mind the limitations of computers is noted. Some significant issues encountered in the research and development of automated hospital information-communication systems are discussed. These include the requirement for systems analysis, the need for specialized personnel, the utilization of a hospital as a laboratory, the necessity for an evolutionary approach, the requirements for terminal development, and

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the characteristics of transferability. Finally, the possible roles of the computer industry, the hospitals, and the public health services in this field of research are touched on. An annotated selected, but not inclusive or extensive, bibliography on the application of computers to patient care is presented.

345

EDUNET REPORT OF THE SUMMER STUDY ON INFORMATION NETWORKS CONDUCTED BY THE INTERUNIVERSITY COMMUNICATIONS COUNCIL (EDUCOM)

Edited by G. W. Brown, J. G. Miller, and T. A. Keenan
New York, John Wiley and Sons, Inc. 1967 440 p

This book is a report of the Summer Study on Information Networks conducted by the Interuniversity Communications Council (EDUCOM) recommending the creation of an EDUNET, a revolutionary new system through which colleges and universities of all sizes and in all parts of the country can have quick access to information and can share their human, library, and computer resources. It is felt that an advanced educational network using all the media could make higher education both more efficient and economical and improve the quality of instruction and research. The technical plans for EDUNET and the services it offers are noted.

346

A GROWING HOSPITAL CRISIS

U. S. News and World Report, May 29, 1967, p. 66-69

Reasons for the changes needed in hospitals. The growing hospital crisis results from skyrocketing costs, personnel shortages, and poor medical services in laboratories and at the bedside. New hospital designs, automation, tighter management, and facility sharing are advocated. Automation is especially stressed. Systems analysis could be used extensively with good results.

347

APPLYING ADVANCED TECHNOLOGY TO HEALTH IN CANADA - A CASE STUDY

Philip Horwitz and Albert L. Stanly

American Marketing Association, World Congress on Marketing, 50th, Toronto, Canada, June 21-23, 1967, Paper 34 p

Description of the application of systems analysis to a particular health care problem in Canada. The problem was one of optimizing the placement of several new buildings which were to be added to existing buildings at the site of a Health Sciences Center. Six plans were evaluated on the basis of required and desired constraints, cost and convenience of personnel traffic, cost of material transfer, and cost of facilities and land. The plan recommended is six million dollars less expensive in initial costs than the original plan and offers significantly lower operating costs.

348

HOSPITALS GET A NEW SPECIALIST

Business Week, Oct. 10, 1964, p. 70, 73, 74

New developments in hospital administration. Hospital administrative responsibilities and problems are discussed. Hospital budgeting, automation, and the satellite hospital concepts to effect cost reduction are described.

349

THE COMPUTER AND HOSPITAL MANAGEMENT

Harry O. Humbert

Financial Executive, Jan. 1967, p. 43, 46, 48, 49

Demonstration of the need for effective coordinated management control in hospitals. Computer systems are offered as the solution to this problem. The transition process from conventional to computer systems is discussed, and the improvements from computerization to the hospital management information system are explained.

350

A SYSTEMS APPROACH TO HIGHER EDUCATION

M. G. Keeney, H. E. Koenig, and R. Zemach

National Science Foundation, Div. of Engineering Research, Final Report (Project C-396), 1967 65 p

Presentation of a discrete-time, state-space dynamic economic model of the input-output flows and unit costs in educational institutions (particularly institutions of higher education). The state vector components are identified as the numbers of students in various levels and fields of education and their associated accumulated cost of education. The input and output variables are flow rates of students, faculty, research and various types of support facilities and their associated unit values. Procedures for validating the model and applying it as an instrument of decision-making in institutional operation and control are discussed. The data processing system to continuously update the model is also discussed.

351

SYSTEMS ANALYSIS AND EDUCATION

J. A. Kershaw and R. N. McKean

RAND Corp., Memorandum RM-2473-FF, Oct. 1959 70 p

Research supported by the Ford Foundation

Results of an investigation of the possibilities of making quantitative comparisons of specific education systems with variants of them in which changes and innovations are incorporated. A study of the educational process, the problems of measurement, and other data indicated that it is feasible to make such quantitative comparisons that can help administrators choose improved educational systems. This is the kind of analysis that offers hope of estimating the relationship between school characteristics and educational output.

352

HOSPITAL COMPUTER PROJECT

Massachusetts General Hospital, Status Report, Memorandum No. 9, 1966 184 p

Research supported by the American Hospital Association and the American Heart Association, NIH Grant No. FR 00263, NIH Contract No. PH 43-62-850

Status of the Hospital Computer Project of the Massachusetts General Hospital at the beginning of 1966. The goals of the information system are outlined. The information flow, computer program specifications, design, checkout and implementation in parallel fashion, and an evaluation of the operation are reviewed. The programs used in patient care and information storage, retrieval, and analysis are described extensively.

353

MAYO ASKS LOCKHEED TO TRAIN ITS SIGHTS ON A TOTAL MEDICAL INFORMATION SYSTEM

Business Week, Oct. 29, 1966 1 p

Results of a systems analysis of the design feasibility of a computerized total medical information system for the Mayo Clinic in Rochester, Minn. The possibility of such a system is being investigated by the Lockheed Aircraft Corp. The immediate object of the proposed system is to speed the information flow and to free doctors from time-consuming routine.

354

SCHOOL SCHEDULING BY COMPUTER - THE STORY OF GASP

Judith Murphy and Robert Sutter

New York, Educational Facilities Laboratories, Inc., 1964 58 p

Discussion of master schedule generation for schools by using Generalized Academic Simulation Programs (GASP) on computers. Schedule generation by conventional methods is discussed. The excessive labor involved and the rigid programs generated are two shortcomings of conventional methods. The cost reduction and complex schedules made possible by GASP are discussed extensively.

355

THE EMPLOYMENT ENTERPRISES CONCEPT

Edward L Page

Ann Arbor, Mich , Social Systems Institute, Inc , 1967 6 p

Introduction of the Employment Enterprises concept as a solution to hardcore unemployment The approach offers noncompetitive labor to comparatively unskilled workers An important part of the program is the instilling of motivation to work in the unemployed

Consideration of general systems theory, a metatheoretical grammar of integrated behavior whereby the growth and development of students may be studied and understood The application of these ideas to the evaluation, diagnosis, management, and treatment of emotionally disturbed students referred to a special counseling service in a preparatory school for boys is described briefly Special attention is devoted to the underachiever The importance of sports and physical training is noted

356

"NEW TOWNS," PRIVATE ENTERPRISE, AND SOCIAL RESPONSIBILITY

Edward L Page

Ann Arbor, Mich , Social Systems Institute, Inc , 1967 12 p

Expansion of the Employment Enterprises concept into the development of New Towns to create a less precarious employment situation Employment Enterprises jobs tend to be dependent upon continuing prosperity The New Towns appear to be a long-range solution to the problems of de facto racial segregation, suburban sprawl, labor-management strife, inadequate tax base, unemployment, and transportation

357

EDUCATION - RICH PROBLEMS AND POOR MARKETS

William J Platt

Management Science, vol 8, July 1962, p 408-418 13 refs

Invitation to management scientists and operations analysts to add education to their agendas Educational decision-makers and policy-makers face options to which systems analysts and economists can make contributions These options are identified as (1) how much to invest in education, (2) how to allocate that investment, and (3) what technology and organization to use

361

A COMPANY LIKE COMSAT TO BATTLE SLUMS IS URGED

Robert B Semple, Jr

New York Times, Nov 27, 1966, p 1 ff

Proposal for setting up a nationwide, nonprofit corporation to build new, low-income housing in slums Basically, the proposal is designed to induce private industry to engage in slum rehabilitation by providing massive Federal financial backing After purchase and rehabilitation, it would be necessary to have the managing carried out in such a way as to maintain a low level of rents Non-profit or limited-profit groups would be preferred Various sources of funds are discussed, and it is pointed out that the organizational structure is unclear

362

PLANNING-PROGRAMMING-BUDGETING IN EDUCATION

T A Struve and G J Rath

Educational Technology, June 15, 1966, p 1-14

View of education as an economic problem It is suggested that decision-making be based on a planning, programming, and budgeting system concept The purpose of programs is to bridge the gap between the budget with poorly defined purposes and the plans with poorly defined costs in order to allocate resources, plan policies, and manage finances and personnel It is recommended that a reporting system be established to determine progress and costs in relation to objectives

358

MANAGEMENT SCIENCE IN UNIVERSITY OPERATION

Gustave J Rath

Gustavon Ill , Northwestern University July 1966 15 p

Grant No NsG-495

Discussion of the state of the art of Management Science in university operation The increased demand for excellence in education, the large-scale expenditures for educational services, and the concern within the university with the acceptance of change are noted Simulation, scheduling, institutional research, and automated instruction are examined

363

U S HOPES TO HARNESS AEROSPACE KNOW-HOW IN MEDICAL RESEARCH FIELD

New York Times, Dec 2, 1966, p 22

Organization by the National Institutes of Health of a group to couple aerospace analytical and engineering techniques to medical research problems

359

OPERATIONS RESEARCH AND SYSTEMS ANALYSIS IN EDUCATION

G J Rath and Richard C Hannenberg

Data Processing for Education, vol 5, Apr 1966, p 1-8

Examination of the contributions that operations research and systems analysis can make to education Some areas for resource allocation, inventory, queuing, sequencing, routing, replacement, and simulation The systems analysis approach is illustrated by its application to the planning of a primary school district The use of computers in education is also discussed One application is the placement of graduates in jobs The use of computers in registering students in courses is not considered acceptable because of the severe limiting of choice Other drawbacks of computers in the education and training process are noted

364

A DATA STORAGE AND RETRIEVAL SYSTEM IN A CHILD GUIDANCE CENTER

Ivan T Vasey

IN SCIENTIFIC PROCEEDINGS IN SUMMARY FORM, AMERICAN PSYCHIATRIC ASSOCIATION, ANNUAL MEETING, 123RD, DETROIT, MICH , MAY 8-12, 1967 Washington, D C , American Psychiatric Association, 1967, p 48, 49

Description of a data storage and retrieval system in a child guidance center The system handles routine information on census tract and demography and the various factors in the development of the phenomena under study The system facilitates periodic reports, statistical analyses, and quick location of individual records

360

A GENERAL SYSTEMS APPROACH TO PROBLEMS IN GROWTH AND DEVELOPMENT

Nicholas D Rizzo, William Gray, and Julian S Kaiser

American Psychiatric Association, Annual Meeting, May 1967, Paper 22 p 12 refs

365

SCIENCE POLICY AND NATIONAL GOALS

Philip H Abelson

Science, vol 151, Feb 4, 1966 1 p

Consideration of the problem of a national science policy Although decisions taken in other countries would have some

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influence it is felt that developments in the nation and especially, national goals are the primary determining factors Another matter which bears on policy formulation is the setting of relative priorities The appropriation of funds is the best measure of goals and priorities, but the need for more clear-cut descriptions of the goals and priorities by politicians is stressed

366

AEROSPACE CORP CALLED WASTEFUL
New York Times, Aug 23, 1965

Results of a House Armed Services Committee investigation of the fiscal and management policy and control of the Aerospace Corp, a nonprofit, Government-owned research company Inefficient management and wasted money were charged Examples of the latter instance include exceptionally high salaries, transportation of a privately owned yacht, dinners, cocktail parties, and the hiring of a public relations firm

367

AEROSPACE NEW GROWTH VISTAS?
Forbes, May 1, 1967, p 55 ff

Examination of attempts by aerospace and defense contractors to diversify into civilian businesses Currently, the most promising area is the solving of social problems The experience of the aerospace companies, especially with the techniques of systems analysis, planning, and engineering, may be applicable to transportation, pollution, education, crime control, and other matters Also discussed are subsystems, supersystems, measuring benefits, marketing, and production problems

368

AIR SAFETY GOES DOWN TWO ROADS ON LAND AND IN PLANES
Business Week, July 22, 1967 1 p

Brief discussion of the air safety problem of avoiding a collision between two commercial aircraft In addition to air traffic control by the airport tower, there is a clear need for an in-flight collision avoidance system for two aircraft to alert each other and take evasive action The analysis, design, and engineering of a feasible satisfactory system are outlined

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THE SCOPE OF SCIENTIFIC TECHNIQUE AND INFORMATION TECHNOLOGY IN METROPOLITAN AREA ANALYSIS

Herman G Berkman
IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES

Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration Edited by S B Sweeney and J C Charlesworth Philadelphia, American Academy of Political and Social Science, 1967, p 165-180

Discussion of a critical problem in today's technology - organization and management for solving urban problems The European technology lag is due to poor management organization The sheer bulk of data handling is overwhelming without managerial aids Systems analysis, operations research, and PPBS, cost-benefit, and cost-effectiveness studies are tools for better urban administration Systems analysis deduces how organizations will respond to change, operations research gives meaning to pure research, and PPBS, cost-benefit, and cost-effectiveness studies are criteria for judging alternatives

370

BIG CITIES DO HAVE A FUTURE - THE PICTURE THAT CITY PLANNERS SEE

U S News and World Report, June 26, 1967, p 46-50

Discussion by city planners of the future of big cities Many of the problems of urbanization are touched upon, and it is made clear that the supercities will require solutions in the areas of transportation, slums, pollution, taxes, costs, zoning, suburbs, jobs, and education Broader planning is needed, and systems engineering is one possible approach

371

THE NATIONAL STANDARD REFERENCE DATA SYSTEM
Edward L Brady and Merrill B Wallenstein
Science, vol 156, May 12, 1967, p 754-762 12 refs

Description of the national standard reference data system for improving access to and disseminating compilations of critically evaluated data on the properties of substances The operation of the system is outlined, and various services and products that are active or are being considered are discussed briefly

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THE USE OF SCIENCE IN PUBLIC AFFAIRS

C West Churchman
IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration Edited by S B Sweeney and J C Charlesworth Philadelphia, American Academy of Political and Social Science, 1967, p 29-48

Discussion of the possible roles science could and should play now and in the future in public policy-making The capabilities and advantages of science as it is commonly understood are reviewed The basic reservations against the compulsive application of the scientific method to public policy-making are given These include the lack of a foundation of objective data and observations to which science can be applied, the problem of determining costs, the scope of a problem, and the assumption of rational goals The political role of science in developing nuclear weapons is mentioned briefly

373

ARMS COST STRESS SCORED BY RICKOVER
Evert Clark
New York Times, June 9, 1967

Review of Rickover's criticism of some present management techniques in the Pentagon, especially cost effectiveness, cost analysis, and economic analysis It is pointed out that human life is not considered a factor at all in cost analyses and that there may be more emphasis on costs and economy than on effectiveness and benefits The importance of social, cultural, and political factors is stressed

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ENGINEERS AS BIG BROTHERS?
Robert C Cowen
Technology Review, Jan 1967, p 5

Discussion of the application of systems engineering skills to the solution of social problems It was found that, in studying urban renewal, mass transport, crime, waste management, pollution, welfare, information systems, and other issues, the engineer has failed to learn his limitations and does not realize he is working with people Invasions of privacy, the freedoms, dignity, and distinctiveness of an individual, and political variables are real aspects which must be considered

375

A COMPUTER SIMULATION MODEL OF MUNICIPAL BUDGETING
John P Crecine
Management Science, vol 13, July 1967, p 786-815.

S5 PUBLIC ADMINISTRATION

Discussion of the resource allocation problem for large metropolitan communities, using a municipal budgeting model. A positive, empirical theory is presented in the form of a computer program. The decision-making processes in departmental requests, the mayoral budget recommendations, and the city council appropriations are illustrated in some detail with flow charts. Behavior not included in the above submodels is touched upon. An overall view of the budget is briefly explored.

376

THE CRITICAL PATH TO COLUMBIA

Business Automation, Aug 1967, p 40-44

Discussion of the critical path method, electronic data processing, and computer techniques used in the planning of a city of 110,000 population, called Columbia, located between Baltimore and Washington. Systems design is considered a key interface between the planners and the computer programmers. The development of a communications system, an improved management system, an economic model system, and prompt decision-making are all part of the planning.

377

CALIFORNIA HIRES AEROSPACE SKILLS

Lawrence E. Davies

New York Times, Jan 10, 1965

Discussion of the possible use of systems analysis and other problem-solving techniques of the aerospace field in coping with earthbound problems of states and the Federal Government, noting that California has let several contracts to obtain ideas for solutions. New concepts are desired in waste management, which includes air and water pollution, information collection, transportation systems, and the care of the mentally and criminally ill.

378

DETERMINING PRIORITIES AND DEVELOPING BASIC RESEARCH ON URBAN PROBLEMS

Thomas J. Davy

IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES
Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration
Edited by S. B. Sweeney and J. C. Charlesworth
Philadelphia, American Academy of Political and Social Science, 1967, p 229-239

Study of a specific aspect of the problem of developing an urban research capability in order to improve urban society government - namely, determining priorities and developing basic research on urban problems. The urban observatories network is an organizational arrangement for linking decision and scholarship on urban problems. It is noted that policy-makers and scholars use different criteria, therefore, an integrated information system will be necessary. The decentralized character of scholarly research, the long-term nature of the project, and the financial requirements are discussed.

379

IMPACTS ON URBAN GOVERNMENTAL FUNCTIONS OF DEVELOPMENTS IN SCIENCE AND TECHNOLOGY

John Diebold

IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES
Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration
Edited by S. B. Sweeney and J. C. Charlesworth
Philadelphia, American Academy of Political and Social Science, 1967, p 85-100 8 refs

Consideration of technology as both a source and a solution to problems in terms of its meaning for urban governments. Technology, which is responsible for a widening of opportunities, also blocks the road toward their achievement. Urban life intensifies the impact of individual action and the need for social control.

Technological change has altered fundamentally the scope and character of urban problems. Population growth, the retraining of unskilled labor, urban crime control, traffic congestion, pollution, unemployment, and antique tax structures are some of the growing urban problems. Systems analysis and the application of the managerial revolution is advocated for the solution of urban problems.

380

A SYSTEMS APPROACH TO THE CITIES

Constantinos A. Doxiadis

General Electric Forum, vol 10, Jan -Mar 1967, p 4-6

Brief discussion of urban problems and urban planning in the final third of this century. It is stressed that the city should be understood as a system and that systems management is needed because the individual parts of a city are not independent. The above is especially true for an ecumenopolis, a universal city consisting of a system of megalopolises. The consideration of human values while utilizing great amounts of energy is deemed most important.

381

HEW GRAPPLES WITH PPBS

Elizabeth B. Drew

Public Interest, no 8, Summer 1967, p 9-29

Evaluation of four planning, programming, and budgeting system (PPBS) studies in the Department of Health, Education, and Welfare. The scope of PPBS and estimates of what it can accomplish have been revised, and the limitations on the ability of program planners to establish measures of commensurability between programs are taken into account. Selected disease control, human investment, improved material and child health care, and improved income maintenance programs are considered. A comparison of programs to aid higher education was thwarted by a lack of information.

382

MATHEMATICAL THEORY OF AUTOMOBILE TRAFFIC.

Denos C. Gazis

Science, vol 157, July 21, 1967, p 273-281 83 refs

Discussion, in the context of a mathematical theory of automobile traffic, of the problems of traffic flow, conflicts of traffic streams, traffic control, and the planning of networks of traffic arteries. Models can be used to investigate the stability of traffic after the introduction of a perturbation into the stream, and a non-linear car-following model is developed. Probability and statistics are useful tools for dealing with the conflict situations.

383

A DYNAMIC MODEL OF THE ECONOMY OF THE SUSQUEHANNA RIVER BASIN TO SUSQUEHANNA RIVER BASIN UTILITY GROUP

H. R. Hamilton, S. E. Goldstone, F. J. Cesario, D. W. Sweet, D. E. Boyce, and A. L. Pugh, III
Battelle Memorial Institute, Columbus Laboratories, (Final)

Research Report, Aug 1, 1966 445 p

Research supported by Baltimore Gas and Electric, Delaware Power and Light, United Gas Improvement, Metropolitan Edison, New York State Gas and Electric, Pennsylvania Electric Co., Pennsylvania Power and Light, Philadelphia Electric, Public Service Electric and Gas, and West Penn Power.

Report on a three-phase research program developing a dynamic mathematical model of the Susquehanna River Basin economy capable of generating economic and water use projections under a wide variety of alternative assumptions. From the model it is found that the water resources are adequate to support economic growth for the foreseeable future without the construction of major systems of river works. Water quality is generally good, a major exception is the occurrence of acid mine drainage along specific reaches of the West and North Branches. Organic pollution is a problem at several places, but one that can be alleviated. Water shortage is not a problem. Various economic projections are given.

384**SYSTEMS APPROACH TO CITY PLANNING**

Cyril C. Herrmann

Harvard Business Review, vol 44, Sept -Oct 1966, p 71-80
 Description of the community renewal program (CRP) of San Francisco, Calif., one example of the application of systems management techniques to the problem of planning urban redevelopment. In the CRP the programs are designed to appeal to businessmen, and the stress is on the private sector with limited public help. Systems analysis and operations research are used to design a model for considering the ramifications of alternate plans and the impact of public action. Some of the programs and policies planned are presented

385**HOUSE PROBERS ACCUSE AEROSPACE**New York Herald Tribune, Aug 23, 1965

Report of the accusation by the House Armed Services Subcommittee that the Aerospace Corp., created by the USAF, is inefficient and mismanages personnel and fiscal fields through loose and extravagant practices. Specific issues are the purchasing of land and construction of facilities instead of using available government facilities, the subsidizing of meals, country club memberships and entertainment for executives, unusually high salaries, relocation allowances, and unlimited sick leave. The management concept, in general, is also vaguely criticized

386**DOD'S RESOURCE MANAGEMENT SYSTEMS TO INTEGRATE INPUTS FOR BIG DECISIONS**

S Peter Kaprielyan

Aerospace Management, vol 1, no 3, Fall/Winter 1966, p 15-23
 Description of the resource management systems of the Department of Defense. Programming was established as a correlative link between planning and budgeting in order to integrate three related input phases of top-level decision-making into a unified system. Cost effectiveness is applied to comparisons of expenditures and performance. In addition to costs and economic analysis, the system includes data and information systems for accounting, management, and reporting procedures. Scheduling is also mentioned

387**HOW THE AIR FORCE FORCES MANAGEMENT LEADERSHIP**

S Peter Kaprielyan

Aerospace Management, vol 1, no 2, Summer 1966, p 21-27
 Description of the four-level management training program used by the System Program Office of the USAF. The two-week indoctrination course includes instruction on terms, methods, policies, procedures, and publications. A twelve-week course is aimed at program management and discusses responsibilities. The graduate management course is for developing management skills for the USAF Systems Command. A twelve-week defense weapons system management center course familiarizes responsible personnel with weapon system acquisition philosophy, methods, and practices common to all Department of Defense components

388**NASA MANAGEMENT AT THE CROSSROADS**

S Peter Kaprielyan

Aerospace Management, vol 1, no 2, Summer 1966, p 3-11
 Discussion of NASA management in the 1960s. The various lessons learned are examined from a customer-contractor vantage point. Project planning steps are outlined. Specific points stressed are the verification of technical feasibility before commitment, detailed design reviews conducted at appropriate times, ground testing in simulated space environment, mission simulation, and extreme care in modifying reliable designs. Procurement, contracting, government-industry relations, and the incentive system are reviewed, and some of the challenges are pointed out, including the attempt to maximize competition

389**THE CITY AND THE COMPUTER REVOLUTION**

John G. Kemeny

IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES
 Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration
 Edited by S. B. Sweeney and J. C. Charlesworth
 Philadelphia, American Academy of Political and Social Science, 1967, p 49-62 6 refs

Study of the impacts of the computer revolution on the city. It is noted that while the population of eight of the ten largest cities has decreased, the growth of suburban areas has increased, and the number of motor vehicles has doubled. It is suggested that the application of computers to urban problems in the next decade will be great. One application discussed is computerized hospital quality control. The major role left to the city of 1990 will be information exchange, while its role as the center of trade and finance will decline. It is predicted that the computer network will be a major public utility

390**THE SCOPE OF LARGE-SCALE COMPUTER BASED SYSTEMS IN GOVERNMENTAL FUNCTIONS**

Joel M. Kibbee

IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES
 Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration
 Edited by S. B. Sweeney and J. C. Charlesworth
 Philadelphia, American Academy of Political and Social Science, 1967, p 181-196

Attempt to indicate the present scope of computer-based systems designed to support particular government functions. The need for experimentation has been recognized, and there are a great number of systems now under development, but difficulties inherent in uncoordinated development still exist. These difficulties are pointed out. Agencies involved in funding computer-based systems should devote attention to problems of coordination

391**THE COMMERCIAL AIRCRAFT INDUSTRY**

A Carl Kotchian

Business Horizons, vol 10, no 2, Summer 1967, p 5-17

Discussion of the growth of the commercial aircraft industry over the next 20 years. New commercial aircraft being built, designed, or studied are described. The exploitation of size in aircraft is discussed with reference to the Boeing 747. Developments in speed center around the supersonic transports being built and a hypersonic plane design. Short-range vertical takeoff and landing aircraft are being tested. It is recommended that systems analysis be used in planning this segment of transportation, and certain areas needing attention are pointed out

392**ARE COMPUTERS BETTER THAN POLITICIANS?**

Arlen J. Large

Wall Street Journal, Apr 28, 1967, p 14

Discussion of the possible use of systems analysis and computers in decision-making and planning by politically oriented segments of government. Technically oriented problems, such as transportation, pollution, information flow, etc., arouse little debate. However, crime studies and social planning are much more controversial

393**WEAPON SYSTEM CONTRACTING**

J. Sterling Livingstone

Harvard Business Review, vol 37, July-Aug 1959, p 83-92

Consideration of the contracting problems associated with managing the development and production of a weapon system, with the idea of reducing lead time in mind. The major issue revolves around the delegation of authority and the responsibilities of the military services. The problems and criticisms of three

55 PUBLIC ADMINISTRATION

methods - the systems engineer and associate prime contractors method, the system prime and associate prime contractors method, and the team contractor method - are discussed. The concentration of work in a few companies and lack of competition are a cause of concern

394

McNAMARA'S DEFENSE STRATEGY
News Front, vol 11, July 1967, p 10-14

Discussion of the accomplishments of the Secretary of Defense in the past and accomplishments expected in the future. McNamara is credited with cutting costs and upgrading existing weapons systems but failing to initiate new weapons systems, except a few of the multipurpose variety. Some improvement in the research, development, and production program is noted

395

AN OVERVIEW OF URBAN OBSERVATORIES

Henry W Maier
IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES
Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration
Edited by S B Sweeney and J C Charlesworth
Philadelphia, American Academy of Political and Social Science, 1967, p 211-220

Review of the background of the urban problem and outline of the function of "urban observatories" in determining government policies. Urban observatories - a network based on a partnership between universities and municipal governments - would conduct research, collect information, and aid in policy decisions. Financial and intellectual resources allocations are viewed as the two largest problems in implementing the concept

396

DEFENSE SYSTEMS MANAGEMENT THE 375 SERIES

Edward J Morrison
California Management Review, vol 9, no 4, Summer 1967, p 17-26

Discussion of the effect of the USAF Systems Command manuals for managing defense systems on government contracting and government/industry relations. The defense system life cycle is outlined in detail, prominent features are expanded government authority, realignment of government agencies, and private industry roles. Several problems that have emerged include the issue of responsibility, management interpretation, centralization in decision-making, and unrealistic documentation requirements

397

A SPACE AGE TRAJECTORY TO THE GREAT SOCIETY

Gaylord Nelson
Eighty-Ninth Congress, First Session, Oct 18, 1965, Congressional Record No 194 4 p

Discussion of a bill entitled the Scientific Manpower Utilization Act and of the application of space-age technology to the solution of various practical problems. A successful experiment in California is described, where some engineering and research institutes were involved in such applications. The need to apply the computer technology, the systems analysis, the management planning, and the research carried out in the space sciences to problems such as water and air pollution, transportation problems, crime control, etc is stressed. The law would allow the Government to make contracts with research institutions in order to make the studies

398

NO ROOM ON THE RUNWAYS?

Forbes, Feb 15, 1967, p 27-31

Outline of ground problems for airlines. Airport congestion causes delays in takeoffs and landings at current airports.

of which there are too few. General aviation accounts for a good portion of the problem. Duplicated airports create additional scheduling problems. Surface transport is unprepared to handle current short-range passenger traffic. Vertical takeoff aircraft would decrease airport congestion but increase air congestion. Finances and opposition to noise by local residents hinder outright expansion of facilities. In short, the failure to build a coordinating air transportation system may delay profits

399

MANAGEMENT IN THE SPACE AGE

Fremont E Kast and James E Rosenzweig
New York, Exposition Press, 1962 183 p 130 refs

This book is an analysis of the concept of weapon system management and its nonmilitary applications. The economic impact of more than \$500 billion spent for national security purposes emphasizes the necessity for the integration of scientific and technological advancement with administrative skills in management and organization. The interest in general concepts and theories created this study of management in advanced technology industries. Weapon system management is a key conceptual framework around which new applications are taking place. The purpose of the book is to trace the weapon system management concept and its impact as an example of the type of project management that is a necessity in the space age

400

ANALYSIS OF PROBLEMS ENCOUNTERED IN R&D PROJECT MANAGEMENT

Roy Poust and Irwin Rubin

Massachusetts Institute of Technology, Alfred P Sloan School of Management, Working Paper No 232-66, Dec 1966 27 p 10 refs

Analysis of 32 research and development projects performed by industrial concerns under government contracts, especially in aerospace and electronics industries. The rankings of frequencies of project problems encountered by project managers were found to be inversely correlated with rankings of importance of problems associated with their position. The rankings of frequencies of problems encountered by project managers and laboratory managers were found to be correlated

401

CASE EXAMPLE NEW APPROACH TO CITY BUILDING

James W Rouse

General Electric Forum, vol 10, Jan -Mar 1967, p 13-15

General discussion of plans for a new city, halfway between Baltimore and Washington, which is to be completed by 1980. The schools and cultural and religious programs are briefly discussed. It is claimed that the experience in planning is transferable to other existing major cities

402

U S FINDS ONLY 1% ON WELFARE LISTS ARE EMPLOYABLE

Robert B Semple, Jr

New York Times, Apr 30, 1967, p 1, 30

Results of an analysis to determine the number of "employables" on welfare. It was found that only 50,000 of the 7.3 million on the relief rolls are employable. There are 2.1 million over age 65, 7 million are handicapped, 3.5 million are children whose parents cannot support them, 9 million mothers and 15 million fathers are the parents of these children, and two-thirds of the fathers are incapacitated. The process of employing the employable on this list is discussed

403

SPACE FOR WHAT?

The Economist, June 18, 1966, p 1307, 1308

S5 PUBLIC ADMINISTRATION

General description of the space program Military aspects and the budgetary problems of NASA are discussed briefly Some future programs are suggested

404

SRI PULLS HARD ON THE GROWTH REINS

Business Week, Mar 25, 1967, p 106, 108-110, 112, 117

Description of Stanford Research Institute's (SRI) five-year program to slow expansion and reduce the percentage of government contracts One factor in SRI's decision is the low return from government research Some future areas of research for SRI are detailed

405

SYSTEMS ANALYSIS IN TRANSPORTATION

Irwin Stambler

Industrial Research, July 1967, p 80-86

Application of systems engineering to the problem of mass transportation Various new technological developments are examined as possible components of an integrated transportation system The various research programs around the country concerning mass transportation are briefly described

406

AEROSPACE INDUSTRY'S ROLE IN SHAPING THE NEW LIFE

Carl F. Stover

Aerospace Management, vol 1, no 3, Fall/Winter 1966, p 5-9

Aerospace industry systems capability studies in California on crime and delinquency, government information, transportation, and waste management The market for systems engineering of urban problems is discussed The interest of various levels of government is demonstrated

407

THE GOVERNMENT AEROSPACE INDUSTRY INTERACTION

H. O. Stekler

California Management Review, Spring 1967, p 55-64 35 refs

Grant No. NSG-243-62

Analysis of the change in the relationship between the Government and the aerospace industry since 1961 when many new management devices were introduced which have improved the efficiency of the procurement process Additional devices by which further procurement efficiencies may be obtained are pointed out These arrangements include such devices as breakouts, an emphasis on incentive and fixed-price contracts, and contractor evaluation procedures

408

SCIENTISTS FEAR DOMINATION BY POLITICS

Walter Sullivan

New York Times, Oct 23, 1966

Determination of Congressional involvement in research Government seems to be taking a greater interest in science than ever before The fear that politics is beginning to dominate science is expressed Some factors that have brought about the change are the big science projects and university funding by the Federal Government

409

SYSTEMS ANALYSIS BY LAND, AIR, AND SEA

Fortune, July 1965, p 121, 244

Case study of the impact of systems analysis on airlift and sea-lift capabilities The massive deployment concept necessitated increased airlift capabilities or stockpiling in likely crisis areas

410

SYSTEMS MANAGEMENT IN AEROSPACE - A GRUMMAN CHALLENGE

E/O College Edition, Feb 1967, p 58-61

Description of the systems management at Grumman Aircraft Engineering Corp for the Lunar Module portion of the Apollo program

411

DEFINING AND IMPLEMENTING THE URBAN OBSERVATORIES CONCEPT

H. Ralph Taylor

IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration

Edited by S. B. Sweeney and J. C. Charlesworth Philadelphia, American Academy of Political and Social Science, 1967, p 221-228

Presentation of the background of the urban observatories concept - a network based on a partnership between universities and municipal governments to aid in the solution of urban problems The size of the task of solving urban problems and the technology required are noted Several limited surveys and demonstration projects have been carried out, but the research and funding are inadequate The urban observatories concept is designed to provide the trained personnel and facilities to permit state and local solutions to these problems It represents a partnership between city administrators and urban specialists in sustaining research The urban observatory and government personnel can systematically approach urban problems

412

THE BUSINESS ROLE IN THE GREAT SOCIETY I - THE COMPUTERS TACKLE SOCIAL PROBLEMS

Jerald Terhorst

The Reporter, Oct 21, 1965, p 26-30

Comparison between corporate- and noncorporate-administered Job Corps camps The vast technical and managerial resources of the big defense and aerospace firms are being marshaled against social problems ranging from poverty and crime to water pollution and transportation

413

SCIENCE AND THE CITY

Washington, D. C., U. S. Department of Housing and Urban Development, 1967 47 p

Application of scientific techniques to urban problems The extraordinary growth of urban population, coupled with the need to replace decay and obsolescence and to meet rising public demands for a higher quality of living, means that new approaches must be found to provide the needed physical facilities and social environment on a scale not previously contemplated To assist in designing new approaches, the Department of Housing and Urban Development and the Office of Science and Technology in the Executive Office of the President sponsored a Summer Study on Science and Urban Development It is intended to give perspective as to how science and technology can be brought to the service of the city rather than specific, immediate solutions

414

SYSTEMS DEVELOPMENT AND MANAGEMENT I - HEARINGS BEFORE A SUBCOMMITTEE ON GOVERNMENT OPERATIONS, HOUSE OF REPRESENTATIVES, EIGHTY-SEVENTH CONGRESS, SECOND SESSION, JUNE 21, 22, 27, 29, JULY 31, AND AUGUST 15, 1962.

Washington, D. C., U. S. Government Printing Office, 1962 337 p

S6 MANPOWER MANAGEMENT

Review of developments in systems and management, with stress on investigations in defense R&D and in the organization and management of missile programs. Recommendations in the Bell report on government contracting for R&D and the concern of the Government Employees Council over contracting to private interests those services and functions usually performed by civil service employees are noted, among other issues. An extensive bibliography is given.

415

THE ROAD TO 1977

Max Ways

Fortune, Jan 1967, p 93-95, 194-197

Examination of the use of systems analysis in planning for the future. The application of systems planning to the problems of poverty and law enforcement is advocated. The relationship between government and industry is discussed.

416

WHAT AEROSPACE SEES ON THE GROUND

Business Week, Sept 25, 1965, p 87, 88, 90

Discussion of the aerospace industry's systems analysis of crime and delinquency prevention and control, waste management, statewide information, and statewide transportation in California. A history of the systems concept is given, starting with its birth during World War II. The systems approach is described briefly, and some future applications are indicated.

417

AEROSPACE MEN TURNING TO PROBLEMS OF EARTHLINGS

John Noble Wilford

New York Times, Dec 5, 1966

Systems analysis by the aerospace industry of various urban problems. Cities with 100-story apartment buildings, very high speed (100-mph) highways, car development, and prosthetics research are proposed.

418

GOVERNMENT AND THE INTELLECTUAL THE NECESSARY ALLIANCE FOR EFFECTIVE ACTION TO MEET URBAN NEEDS

Robert C. Wood

IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES

Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration

Edited by S. B. Sweeney and J. C. Charlesworth

Philadelphia, American Academy of Political and Social Science, 1967, p 3-14

Determination of solutions to various urban problems and government action in solving the problems. Now that the social sciences are becoming an adequate quantitative research field, the basic problem is combining government action with existing scholarship or stimulating the necessary and appropriate scholarship. Federal aid to local programs, orderly metropolitan growth, experiments, collaboration, and the use of technology to reduce cost are also briefly mentioned.

419

PUBLIC ADMINISTRATION STUDY, PRACTICE, PROFESSION

Helen C. Hilling

Public Administration Review, vol 26, Dec 1966, p. 320-328

7 refs

Review of the relationships among the academic, practical, and professional approaches to public administration, suggesting they draw more closely together. A conceptual framework is suggested for curriculum to establish a bridge between forces influencing practice and available knowledge and providing a basis for educational programs to meet current needs and needs which can be forecast for the immediate future.

420

A SYSTEMS APPROACH TO DEVELOPMENT ADMINISTRATION A FRAMEWORK FOR ANALYZING CAPABILITY OF ACTION FOR NATIONAL DEVELOPMENT

Saul M. Katz

Washington, D. C., American Society for Public Administration, Comparative Administration Group (Papers in Comparative Public Administration Special Series No. 6), 1965 59 p 81 refs

Investigation of elements for constructing a normative framework for national developmental action, which helps determine which questions will be useful in evaluating and improving a government's potentiality for developmental action and which ones will be self-defeating. A systems approach is proposed, which provides a framework for analyzing, relating, and weighing the many, complex empirical realities of development.

421

THE ROAD TO PPB THE STAGES OF BUDGET REFORM

Allen Schick

Public Administration Review, vol 26, Dec 1966, p 243-258
24 refs

Study of one stage of budgetary reform in the U.S. - the one associated with planning, programming, and budgeting a system. All three stages have their own special characteristics of orientation and differences. Summing up these differences, it is shown that the ethos of budgeting will shift from justification to analysis - i.e., budget decisions will be influenced by explicit statements of objectives and by a formal weighing of the costs and benefits of alternatives.

422

II - THE "SYSTEMS" APPROACH

C. H. Springer

SR, Jan 14, 1967, p 56-58

Discussion of the revolution in American education since the introduction of the space age, which created the need for a rational, systematic approach, implying continuous education. There is a constant need to keep up to date. In business and industry, faced by the technological progress of automation, the same conditions apply in order to avoid unemployment. These challenges can be mastered by a "systems" approach, aided by computer technology.

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423

INFORMATION FLOW IN AN R&D LABORATORY

Thomas J. Allen and Stephen I. Cohen

Massachusetts Institute of Technology, Alfred P. Sloan School of Management, Working Paper No. 217-66, Aug 1966 28 p 16 refs
Grant No. NsG-235-62, NSF Grants No. GN-233, No. GN-353

Examination of the flow of information both into and within the confines of a small research organization.

424

THE TOTAL MARKET ENVIRONMENT SIMULATION

Arnold E. Amstutz and Henry J. Claycamp

Industrial Management Review, Spring 1966, p. 47-60 7 refs
Research supported by the Sloan Research Funds

Discussion of the total market environment simulation - an approach to management education which offers students an op-

S6 MANPOWER MANAGEMENT

portunity to gain realistic management problem-solving experience to gain an improved understanding of management processes, and to develop skills important to effective management

425

PERSONALITY AND ORGANIZATION THE CONFLICT BETWEEN SYSTEM AND INDIVIDUAL

Chris Argyris

New York, Harper and Brothers, 1957 291 p

This book discusses organizational behavior, a new behavioral science. The reactions of healthy individuals to organizational stimuli are discussed at length. Human adaptive behavior is related to formal and informal organizations

426

WE MUST MAKE WORK WORTHWHILE

Chris Argyris

Life, vol 62, May 5, 1967, p 56-58.

Presentation of two principles on which the design of almost every organization is based - work should be simplified and specialized so that it will be easier to plan, control, and direct, and management should not be directly involved in producing the work. The consequences of these principles are discussed from employees' and management's points of view. It is concluded that the fundamental structure of industry and management often creates conflict and undermines the real needs of employees

are ascribed to conflicts between the personal goals of a professional technician and the goals of management, which in many cases cannot practically be reconciled. The status system of industry is found to be definitely detrimental, and it is pointed out that scientists need recognition, financial and otherwise. Extremely detailed relevant data are included

430

DOCTOR, LAWYER, INDIAN CHIEF
News Front, Apr 1965, p 24-27

Investigation of factors determining vocational choice. The parent-child relationship is found to be fundamental in developing personality factors relevant to occupational choice. These factors may be encouraged or frustrated, depending upon the parents' values and interests. Although this orientation is not irrevocable - it could be altered by later experiences beyond the home in school or work - the child's first experience with his parents sets the tone for his later relations with others

431

ECONOMIC CRITERIA FOR EDUCATION AND TRAINING

R S Eckaus

Review of Economics and Statistics, May 1964, p 181-190 9 refs
Research supported by the Rockefeller Foundation

Review of the current trend to establish economic criteria for education. The use of rate of return is critically evaluated, and an alternative approach is suggested. The application of this approach to education and manpower planning is discussed

432

HOW TO PREVENT ORGANIZATIONAL DRY ROT

John W Gardner

Harper's Magazine, Oct 1965 3 p

Outline of rules for organizational renewal. An organization should have (1) an effective program for the recruitment and development of talent, (2) a hospitable environment, (3) built-in provisions for self-criticism, (4) internal fluidity, (5) an adequate system of internal communication, (6) means to prevent the procedure's owning the man instead of vice versa, (7) means of combating vested interests, (8) an interest in the future, and (9) morale

433

COMPUTER SYSTEMS ANALYSTS PROBLEMS OF EDUCATION, SELECTION, AND TRAINING

Frank Greenwood and Erwin M Danziger

New York, American Management Association (Management Bulletin 90), 1967 42 p

Research study to set up guidelines for the education, selection, and training of computer analysts. This research is intended to help organizations realize the vast potential of today's computers and the role of analysts to solve business problems. The way computers are used is heavily influenced by this analyst. He has an impact on such basic matters as when computer start-up costs are recovered and what will be the computers contribution to profits

434

COORDINATION

Franklin Pierce Huddle

California Management Review, vol 9, no 2, Winter 1966, p. 9-16 12 refs

Discussion of the kinds of coordination. Planning, organizing, executing, and rewarding are four stages in any human enterprise, and any enterprise is a system of communications. In an enterprise system, a sequence of communication bits is an operation, and the

428

DOES AUTOMATION RAISE SKILL REQUIREMENTS?

James R Bright

Harvard Business Review, vol 36, July-Aug. 1958, p. 85-98 6 refs

Analysis of the relation between automation and skill requirements. A hypothesis is offered as to how automation affects human contribution to production tasks. This hypothesis helps to explain many labor, skill, and training results of automation that are quite at odds with common claims and casual assumptions

429

THE CONFLICT BETWEEN THE SCIENTIFIC MIND AND THE MANAGEMENT MIND

Public Opinion Index for Industry, Research Report, vol 17, no 9, 463-N, Sept 1959 95 p

Results of a study of the tensions between management and the scientists and engineers of industry. The sources of the tensions

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functional relating of operations is coordination. Today's enterprises are assembled into larger and larger totalities, comprising larger and larger numbers of operations which, in turn, require broader and deeper coordination.

435

THE PERSONNEL MAN AS BUSINESS SYSTEMS ENGINEER

Daniel E. Knowles

Personnel, Mar -Apr 1964, p 41-44

Illustration of what can be accomplished by a personnel man who acts as a business systems engineer. Personnel departments and managements are considered to be the administration of person-to-person relations between employer and employees. In reality their work consists of statistics and other paper work needed to keep track of employee records, which involves considerable handling costs. To streamline the work and reduce the financial burden of it, the departments could use a personnel man, who in addition to being versed in personnel practices and procedures, has a working knowledge of data processing.

436

MOTIVATION IS NOT ENOUGH

Harold J. Leavitt

Stanford Bulletin, Autumn 1966, p 20-27

Analysis of the part human motivation plays in management. Motivation alone is not enough for managers to move their organizations. There are at least three sets of valves available for that purpose - the motivational, the structural, and the technological valves. The problem is that when one valve is activated the other two are influenced. The manager, in choosing which of the three to utilize, should first determine the task his organization is trying to do and then make his choice.

437

THE MANAGEMENT SCIENCE SYNDROME

Richard I. Levin

Data Management, Jan 1967, p 36, 37

Analysis of the origin of the perpetual conflict between the management scientist and the manager. Shortcomings in present undergraduate management science education, which provide an initial and often minimal exposure to the subject, and in graduate education are blamed. The graduate and undergraduate types often confront each other in real life, clashing head-on as line manager and staff specialist. This confrontation is magnified by the fact that both in a sense are unequipped to solve the problem they have together created. Several remedial actions are suggested for gradual solution of the problem.

438

EMERGING EXECUTIVE AND ORGANIZATIONAL RESPONSES TO SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS

Matthias E. Lukens

IN GOVERNING URBAN SOCIETY NEW SCIENTIFIC APPROACHES
Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration
Edited by S. B. Sweeney and J. C. Charlesworth
Philadelphia, American Academy of Political and Social Science, 1967, p 113-127

Investigation of the extent to which executives and organizations have adopted modern management techniques and how they are responding to these scientific and technological developments. Management concepts have gone through three development periods -

the scientific management period stressing efficiency, the human relations era stressing motivation and dignity, and the present management science return to quantification. The overestimation of the impact of management science on the executive is explained by discussing the management functions. The ultimate solutions to complex urban problems involve political value judgments. The impact of the new management science techniques is explained from the view of the executive, the organization, and values.

439

THE RESEARCH PARASITE

Clyde Manwell

Science, vol 149, Aug 20, 1965, p 813, 814

Comments on a previous article about research parasites at universities. The research parasite is, in the opinion of Davenport (1965), "a new generation of faculty members, nursed on NIH-NSF support, " responsible for states of affairs such as the correlation between teaching and research. In Manwell's opinion, it is not the "new generation" who is responsible, nor is the nursing on NIH-NSF support. He says the problems are intrinsic to the general organization and basic philosophy of the megauniversity and antedate the creation of the various granting agencies. The real research parasite in the university is the individual who feeds on the research of others who are under him.

440

"TO REACH FOR THE STARS"

William W. Mullins

Carnegie Review, Apr 1967, p 4-8

Examination of engineering education, indicating its historical roots, some of the recent influences that have had a major impact on the form it has taken, and some of the current trends (the growing recognition in engineering schools and in the profession at large of the importance of those technical problems which have a sociological component). These problems are particularly pronounced in urban areas and have led to an emerging field called urban engineering.

441

MANAGEMENT OF GOVERNMENT PROGRAMS

Simon Ramo

Harvard Business Review, vol 43, July-Aug 1965, p 6-8, 10, 12, 163

Study of the development of program management in the different branches of government. The increasing importance of program managers in better management of government programs, industry's stake in it, the workability of incentive systems, and personal competence, status, responsibility and authority of the program manager are discussed.

442

THE SYSTEMS CONCEPT IN CORPORATE MANAGEMENT EDUCATION

Edward B. Roberts

General Motors Corp., Training Directors' Conference, General Motors Institute, Flint, Mich., July 27, 1966, Paper 26 p

Outline of three points connected with the systems concept in corporate management education. First, the corporation is a system with different flows which create together the total corporate environment and performance. Second, training experience and situation are a systems activity, and, third, in problems, one can analyze the needs of the customers for management development by examining their long-run total flows and demands for skills and skills changes in the organization.

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443

THE IMPACT OF TECHNOLOGY ON HUMAN RELATIONS I - AUTOMATION, THE OFFICE, AND WHITE COLLAR PERSONNEL

Leonard R. Sayles

Best's Life News, Sept 1966, p 32-34

Discussion of the impact of automation on the office and white collar personnel - in particular, the effect on employment opportunities, increase or decrease of productivity, human behavior, and current educational training requirements

444

THE IMPACT OF TECHNOLOGY ON HUMAN RELATIONS. II - THE WHITE COLLAR WORKER IN THE MID-1960'S - PERSONALITY AND PERFORMANCE

Leonard R. Sayles

Best's Life News, Oct 1966, p 90-97

Discussion of the impact of automation on the office and white collar personnel, from the point of view of the role played by women in clerical work. Mental health, education, training, testing, and constructive outlets are considered

445

SIXTY-SECOND MAN IN A PICO-SECOND WORLD

Robert E. Slater

California Management Review, vol 9, no 3, Spring 1967, p 3-6

Discussion of a fundamental problem caused by increasing emphasis on computer speed, random access, retrieval and real time - the capability of the individual who is both originator and recipient and who will soon find himself in a picosecond world. Managers, in the growing thrust of information technology, will have to know how to communicate with computers, will have to keep up with developments, and will have to learn to digest and use a computer's output or to identify his role as manager clearly and quantitatively enough to avail himself of EDP

446

MODERN SYSTEMS MANAGEMENT AND THE SYSTEMS GAME

Milton C. Spett

Systems and Procedures Journal, Nov-Dec 1966, p 22-28

Techniques for managing systems analysts. Since computers have become more human, a "new race," fathered by the computer technicians and mothered by the managers, has developed - the systems analysts. The systems game is played with a variety of subtle and imaginative ploys. Outlined are some of the most important techniques for successfully managing the new race of systems analysts or ending the current systems game

447

THE ROLES OF PUBLIC OFFICIALS AND EDUCATORS IN REALIZING THE POTENTIALS OF NEW SCIENTIFIC AIDS FOR URBAN SOCIETY

Carl F. Stover

IN GOVERNING URBAN SOCIETY: NEW SCIENTIFIC APPROACHES
Research sponsored by the Fels Institute of Local and State Government and the American Society for Public Administration
Edited by S. B. Sweeney and J. C. Charlesworth
Philadelphia, American Academy of Political and Social Science, 1967, p 129-142

Study of the problems of urban society and technology. The interconnection between technology and the natural world is pointed out. Social arrangements can make certain technology possible, and technology can give rise to appropriate social arrangements. Because of the last fact, the use of technology is a matter for both politics and government. There is a clear need to determine goals and the consequences of various technological actions. One role of public officials is to concern themselves with the former, and the role of educators is to study both, especially the latter.

448

THE SYSTEMS APPROACH TO PERSONNEL MANAGEMENT

New York, American Management Association (Management Bulletin 62), 1965, 24 p

Four papers on the systems approach to personnel management are included in this bulletin. One paper discusses management control, which is found to be moving toward decentralization. In the second paper, the total-system approach to management command and control is summarized. The third paper discusses personnel's problems in balancing the supply and demand of manpower and suggests that a personnel data system is needed to accomplish this task. The fourth paper discusses the impact of technology on manpower demand and supply and suggests that because of productivity increases and continued increases in the labor forces, labor supply and requirements should be matched through educational and vocational media to prevent the replacement of men by machines.

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449

SYSTEMS THEORY AND MANAGEMENT

Richard A. Johnson, Fremont E. Kast, and James E. Rosenzweig
Management Science, vol 10, Jan 1964, p 367-384

Discussion of the systems concept and management. Structuring business according to the systems concept does not eliminate the need for the basic functions of planning, organization, control, and communication. Systems concept provides a framework for visualizing internal and external environmental factors as an integrated whole. It allows recognition of the proper place and function of subsystems. It means a definite change of emphasis, for the functions are performed in conjunction with operation of the system and not as separate entities - everything revolves around the system and its objectives, and the functions are carried out only as a service to this end.

450

A PROGRAM OF RESEARCH IN BUSINESS PLANNING

H. Igor Ansoff and Richard G. Brandenburg
Management Science, vol 13, Feb 1967, p B-219 to B-239
49 refs

Outline of a research program needed to improve the state of the art of business planning. The approach to this task is relating planning to management science and to certain areas of descriptive knowledge. From these relations a comprehensive program on planning has been created to give the business planner a sense of unique identity and to provide him with a research program which he can pursue in strengthening this identity.

451

IMPLICATIONS OF ON-LINE, REAL-TIME SYSTEMS FOR MANAGERIAL DECISION MAKING

Donald C. Carroll

Massachusetts Institute of Technology, Alfred P. Sloan School of Management, Working Paper No 165-66, 1966, 34 p 34 refs
Contract No Nonr-4102(01)

Discussion of a rapidly expanding new information technology - on-line, real-time systems implications for managerial decision-making. These on-line, real-time systems provide the ultimate

S7 IMPACT ON MANAGEMENT

capabilities in both the data base and procedural aspects of decision-making. The main effects are seen in operational control and in the systems design aspects of management control, because all of the cited qualities are important in those functions

452

THE EFFECTIVE DECISION

Peter F Drucker

Harvard Business Review, vol 45, Jan -Feb 1967, p 92-98

Outline of steps involved in decision-making. Effective decision-making is the "specific" executive task. Such a decision is made as a systematic process with clearly defined elements and in a distinct sequence of steps. Decision-making that has significant and positive impact on the entire organization, its performance, and its results characterizes the effective executive

453

INDUSTRIAL DYNAMICS A MAJOR BREAKTHROUGH FOR DECISION MAKERS

Jay W Forrester

Harvard Business Review, vol 36, July-Aug 1958, p. 67-96

Research supported by the Sloan Research Fund and the Ford Foundation

Principles unifying the different facets of professional development. Industrial dynamics is a major breakthrough for decision-makers. They have come to understand how industrial company success depends on the interaction among the flows of information, materials, money, manpower, and capital equipment. This understanding will lead to better usage of available information, to improved understanding of advertising effectiveness and the dynamic behavior of the consumer market, and to company policies that keep pace with technological change

454

THE ANALYSIS OF MANAGEMENT DECISIONS (Revised Edition)

William T Morris

Homewood, Ill , Richard D Irwin, Inc , 1964 551 p

The decision process is used in this book as a conceptual structure for organizing an analysis of scientific staff assistance in management decision-making. The processes by which business decisions are made are examined. Some of the topics covered include managerial economics, the effects of certainty, risk and pressure on decisions, data gathering, prediction and judgment, multiple goals and taxes in evaluating outcomes, replacement, inventory, bidding and purchasing policies, and diversification

455

DECISION-MAKING FOR DEFENSE

Charles J Hitch

Berkeley Calif University of California Press, 1965 83 p

79 refs

This book describes the use by the Department of Defense of management techniques to achieve balanced programs and more effective forces without greatly affecting organizational structure. The history of the management of the Department of Defense from 1789 through 1960 is presented. The techniques used to aid in making decisions affecting national security - the planning, programming, and budgeting techniques - and the method of systems analysis - used in complex situation evaluation - are discussed in detail

456

MANAGEMENT DECISION MAKING

Max D Richards and Paul S Greenlaw

Homewood, Ill , Richard D Irwin, Inc , 1966 564 p

This book is a general introduction to management, covering both organizational behavior and decision-making by quantitative analysis methods. Key phases of decision-making and various approaches to it are provided. Emphasis is on problem-solving approaches without being overly descriptive. The major topics covered are individual and group behavior, leadership, organizational design, organizational planning and control, acquisition and allocation of resources, inventories, simulation, and economic models

457

SCIENTIFIC DECISION MAKING IN BUSINESS READINGS IN OPERATIONS RESEARCH FOR NONMATHEMATICIANS

Abe Shuchman

New York, Holt, Rinehart and Winston, Inc , 1963 568 p

This book is a collection of articles that best describe the aims, methods, and tools of management science or operations research without using technical jargon or complex mathematical symbolism. The methodology of operations research is discussed extensively, with emphasis on techniques and models and model-building. Also included are selections that describe the application of these methods and tools to specific problems of production, marketing, and finance

458

THE SHAPE OF AUTOMATION FOR MEN AND MANAGEMENT

Herbert A Simon

New York, Harper and Row, 1965 111 p

This book explores the extent to which computers will eventually change the decision-making process and the scope of the executive's job. What automation may mean for the future of business and the economy is reassessed

459

STRATEGIES FOR ALLOCATING FUNDS

Seymour Tilles

Harvard Business Review, vol 44, Jan -Feb 1966, p 72-80

8 refs

Consideration of funds allocations - the most significant mechanism for companies to determine their future. The forward-looking chief executive needs a way of allocating funds consistent with his role as strategist. The four major criteria taken together - missions, product portfolio, geography, and distinctive competence - provide a set of criteria for funds allocations which emphasize the three essential perspectives for strategic choice. They are concerned with the total company, they deal with competitive posture, and they are future-oriented

460

WHY BUILD - AND WHEN? A PATTERN FOR DECISION MAKING

Dun's Review and Modern Industry, Apr 1958, p 68 ff

Proposal of a four-point pattern for decision-making. More long-range planning in medium-size companies, the need for flexibility, the integrated point of view, and the problem of people are guides for management as to "what," "when," and "where" to build the plants for tomorrow. Guidance in assessing needs, location, the latest in factory design, cost-saving approaches to construction, and developments in layout and materials handling is offered

461**INNOVATIONS AND INHIBITIONS IN ORGANIZATIONAL STRUCTURE**

Chris Argyris

Crowell Collier Institute of Continuing Education, Critical Issues in Management Luncheon Series, New York, N Y, Dec 15, 1966, Paper 15 p

Results of nine studies on product planning and program reviews. The relations among top management, the project manager, and the rest of the organization are discussed. Human behavior is analyzed as a function of computer technology and data analysis, and some guidelines are given as to what the functioning of an organization should be

462**COMEBACK AT CARBORUNDUM**

John Berry

Dun's Review and Modern Industry, Apr 1966, p 37, 39, 105, 108, 109

Examination of the return to vitality of the Carborundum Co by means of diversification. The Carborundum Co today is a company experiencing a rebirth as a result of top-to-bottom reorganization. Tight profit centers of responsibilities are created by giving each manager in the far-flung Carborundum empire a sense of total company objectives

463**MORE ROOM AT THE TOP?**

John Berry

Dun's Review and Modern Industry, Mar 1967, p 29-31

Delineation of basic trends in U S corporate life today which point up the compelling need to make room at the top. Command decisions must be made at the top, imposing increasing burdens on the chief executive officer, and no man, however exceptional his intelligence, can handle or be expert on every phase of business from production to marketing, from finance to advertising. The solution may lie in "multiple management" - i e , in pooling strongly contrasting backgrounds to provide broad-gauged leadership and to lighten decision-making

464**UNDERSTANDING PROJECT AUTHORITY - CONCEPT CHANGES MANAGER'S TRADITIONAL ROLE**

David I Cleland

Business Horizons, vol 10, no 1, Spring 1967, p 63-70. 11 refs

Discussion of project management - the concept that has been developed to deal with situations where production and marketing strategies for new products do not fit into a purely functional type of organization. It is a relatively new concept and, at the present time, is employed mainly in developing military and defense industrial products. It is strongly indicated, however, that it will spread in the nondefense industries as well, changing the relationships found in the traditional pyramid organizational structures

465**TEAM AT THE TOP**

D Ronald Daniel

Harvard Business Review, vol 43, Mar -Apr 1965, p. 74-82

Solution to the problem of having only one top executive to shoulder major responsibilities. The team-at-the-top concept - a new concept of a plural chief executive magnifying the capacities of the top office to deal with the full range of its responsibilities - wisely conceived and carefully applied will substantially advance the effectiveness and well-being of an entire enterprise

466**A NEW CORPORATE DESIGN**

Jay W Forrester

Industrial Management Review, Fall 1965, p 5-17 12 refs

Basic characteristics of a new corporate design suited to those industries which feel the impact of rapid change in science and technology and in which conventional management approaches have often been found wanting

467**THE COMPUTER REVISITED**

Glenn Gilman

Business Horizons, Winter 1966, p 77-89

Discussion of the impact of computer technology on management decision-making and organizational behavior in complex agencies. Computer application offers the only realistic solution to problems such as the burden of administration at middle and lower levels that has forced managers to ignore less immediately pressing innovative and leadership responsibilities. However, computers will not change organization structure and the role of management, but will require more adequate managers

468**HOW THIOKOL WEATHERED THE STORM**Business Week, Nov 12, 1966, p 98-100, 105, 106

Design by the Thiokol Chemical Corp to expand further into the commercial market. Thiokol, hard hit by a sudden slump in government sales, made a dramatic comeback by undergoing a drastic top-to-bottom reorganization and investing in new product lines

469**ORGANIZATIONS AND THE SYSTEM CONCEPT IN THE SOCIAL PSYCHOLOGY OF ORGANIZATIONS**

Daniel Katz and Robert L Kahn

New York, John Wiley and Sons, Inc, 1966, p 14-29

Comparison of the open-system approach with traditional approaches which have tended to view the human organization as a closed system - i e , to accept popular names and stereotypes as basic organizational properties and to identify the purpose of an organization in terms of the goals of its founders and leaders. This tendency has led to a disregard of differing organizational environments and the nature of organizational dependency on environment. It has led, also, to an overconcentration on principles of internal organizational functioning, with consequent failure to develop and understand the processes of feedback that are essential to survival. The open-system approach begins by identifying and mapping the repeated cycles of input, transformation, output, and renewed input which compromise the organizational pattern and accounts for organizational environments and organizational dependency on environment

470**DO MANAGEMENT CONTROL SYSTEMS ACHIEVE THEIR PURPOSE?**

Douglas McGregor

Management Review, Feb 1967, p 4-18

Discussion of the objectives of management. Management control systems do not always perform as well as managers desire. One fundamental reason control systems often fail and sometimes boomerang is that those who design them fail to understand that an important aspect of human behavior in an organizational setting is that noncompliance tends to appear in the presence of a perceived threat. The question is not whether management believes the control procedures are threatening, the question is whether those affected by them feel they are

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471

GROUP MANAGEMENT, EUROPEAN STYLE

F Newton Parks

Business Horizons, vol 9, no 3, Fall 1966, p 83-90

Description of group management and its function Collegial management is a concept meaning, in general terms, the collective responsibility of a top management group for the conduct of the affairs of the enterprise with the basic objective of maintaining a division and balance of power among management members It is aimed at either preventing or restricting monocratic authority in management

472

INDUSTRY VIEW OF SYSTEMS MANAGEMENT TECHNIQUES AND TEAMWORK - B-70 EXPERIENCE AND TRENDS

R H Ruud

AFSC Management Conference, Monterey, Calif., May 2-5, 1962, Paper 15 p

Discussion of systems management improvement at North American Aviation, Inc., in connection with the B-70 program (one of the first complete systems management roles assigned to industry) Improvements were concerned with production control by the program evaluation and review technique (PERT), a value engineering and source data collection system, and with complete revision of cost control procedures by introducing electronic data processing to make cost data available on a more timely basis Methods of distributing dollar allocations and conducting periodic management reviews were also improved

473

ORGANIZATIONAL PSYCHOLOGY

Edgar H Schein

Englewood Cliffs, N J, Prentice-Hall, Inc (Foundations of Modern Psychology Series), 1965 114 p

Organizational psychology topics are covered briefly in this book The field has derived from industrial psychology, industrial sociology, and social psychology Chapters include psychological problems in organizations, personnel recruitment, selection, training, and allocation, the relation between organizations and management, group and intergroup relationships, the system aspect of organizations, and organizational effectiveness A selection of titles for further reading is given

474

UNDER THE SYSTEMS APPROACH WHICH PROJECT COMES FIRST?

E J Schmit

Modern Materials Handling, vol 22, Feb 1967, p 45-47

Systematic method of evaluation approach toward multiproject materials-handling improvement program This approach should result in an integrated system which can be achieved on an economically consistent basis, with gradual progress toward the all-important goal of lowered costs or best return on investment Basically, it is a work-organizing and scheduling plan consisting of two variables - control functions and precedence functions - which are then combined into a priority plan

475

THE IMPACT OF AUTOMATION ON THE MANUFACTURING EXECUTIVE'S JOB

Gabriel N Stilian

Management Review, Mar 1958, p 19-23, 89-93

Discussion of the impact of automation on the manufacturing executive's job In the race for competitive advantage, automation is forcing him to attain much higher levels of professional performance and to develop some new management ideas and practices

The key problems, following automation, that the manager must cope with are increased investment and operating risks, increased inflexibility and complexity of operations, and increased precision and reliability requirements of the total system

476

ORGANIZATIONAL PLANNING

Robert L Swinh

Industrial Management Review, Spring 1966, p 57-70 7 refs

Analysis of organization planning A goal-setting technique of allocating goals which bridge the subsystem interdependencies, while not imposing an authority hierarchy, resulted in developing collective responsibility for the success of the whole system

477

COMPUTERS, DECENTRALIZATION, AND CORPORATE CONTROL

L G Wagner

California Management Review, vol 9, no 2, Winter 1966, p 25-32

Description of a system developed at Northern Natural Gas Co to tackle the problem of controlling a decentralized system Although it is mainly concerned with personnel management, the basic principles apply to all functions and to all companies Any corporation can achieve continuous, efficient control by quantifying and measuring functions at all levels The systems must be computer-oriented to avoid an otherwise enormous clerical task

478

INVESTING IN MODERN MANAGEMENT THE "FREE-FORM" CORPORATION

John Westergaard and Richard H Fields

New York, Equity Research Associates, Report, Sept 20, 1966 26 p

Comparison of the two schools of management - the "free-form" school of Litton Industries and the General Motors school The Litton school of "free-form" management maintains a view of the corporate manager as a humanist with a commitment to something larger than the mere operation of a business, while the General Motors school views the corporate manager as a specialized taskmaster with defined responsibilities within a tightly structured system of communications and decision-making "Free-form" management is considered to make a corporation a more profitable investment for the future than management by the General Motors school It is felt that by entertaining flexibility, initiative, creativity, and adaptability, in addition to efficiency, free-form-managed companies will have a better potential for growth Investors should identify and evaluate such management in considering investment opportunities and objectives Criteria for such activity are discussed

479

MEASUREMENT AND APPRAISAL OF THE PERFORMANCE OF FOREMEN

Gunnar Westerlund and Lennart Stromberg

British Journal of Industrial Relations, vol 3, Nov 1965, p 345-362

Study of the assessment and measurement of a foreman's performance Assessment of a foreman's performance by his superiors can be based on quantitative information about his performance, measured against his subordinates' productivity, and what is happening in his department (absence rates, number of accidents, personnel turnover, etc.) That is, the appraisal involves not only an estimate of performance but also a subjective assessment of the foreman's personal characteristics This empirical study, however, is not interested merely in the individual case It seeks to relate the achievement of one foreman to that of others

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Preferably, there should have been a number of independent continua, on which the individual foreman's performance could be located

480

NETWORK-BASED MANAGEMENT SYSTEMS (PERT/CPM)

Russell D Archibald and Richard L Villoria

New York, John Wiley and Sons, Inc , 1967 508 p

Network-based management information and control systems, such as the program evaluation and review technique (PERT) and the critical path method (CPM), are covered in this book. Various fundamentals involved in network-based management systems are presented and the problems of adapting a model system to a particular environment in a given organization are dealt with. Specific cases are reviewed, and some limitations and the possibilities for future development are outlined

481

ENTERPRISE MODELS A NEW MANAGEMENT TECHNIQUE

D Franklin Boyd

Industrial Management Review, Fall 1966 16 p 5 refs

Discussion of enterprise models which provide a considerably broader scope than models limited to a cost center. The unequivocal management orientation of enterprise models makes them a promising tool for helping management in making a wide range of operational, tactical, and strategic decisions and decisions in areas where mathematical models are not applicable.

482

THE BOUNDLESS AGE OF THE COMPUTER

Gilbert Burck

IN MARKETING IN PROGRESS PATTERNS AND POTENTIALS

Edited by H C Barksdale

New York, Holt, Rinehart and Winston, Inc , 1964, p 166-185

Discussion of the changes brought about in marketing management and business administration by the development of the electronic computer. The electronic computer may be the most important agent of change that business or government or education has ever known. Electronic computers have increased the businessman's ability to plan and control activities of all kinds, from simple machine operations to complex distribution systems. The "general problem-solver" programs are discussed

483

BIOMATHEMATICS AND COMPUTER SCIENCE

Lee D Cady, Jr

Science, vol 156, June 2, 1967, p 1265, 1266

Brief run-down on papers discussed at the Symposium on Biomathematics and Computer Science in Life Sciences held in Houston, Tex in March 1967. Subjects such as data analysis, mathematical models of physiological processes, laboratory automation, medical information management systems, computer simulation instruction, literature retrieval, etc , were presented, and summaries are given of some of the papers

484

SYSTEMS APPROACH TO INTEGRATING COST AND TECHNICAL DATA

Howard M Carlisle

Management Services, July-Aug 1967, p 34-41.

Description of a management reporting system which involves simple integration of the concepts behind mulepost reporting, utilizing the Gantt chart approach and the concepts of the forecast

budget. The increasingly technical nature of many industries poses a problem, which is new in terms of size and scope, in merging technical and cost data for meaningful management decisions. IMPACT, a program merging the mulepost chart and the forecast budget into a common plan in which each element - systems approach to integrating cost and technical data - is considered

485

AN INDUSTRIALIST VIEWS INDUSTRIAL DYNAMICS

Bruce R Carlson

Industrial Management Review, vol 6, no 1, Fall 1964, p 15-20

Application of industrial dynamics simulation to actual business situations. Industrial dynamics has evolved from a search for techniques of applied problem-solving to longer-range research, leading to the development of new insights into the causes of system behavior

486

CONTRACTOR PERFORMANCE EVALUATION SYSTEM

Aerospace Management, vol 1, no 1, Spring 1966, p 13-15

Description of a Contractor Performance Evaluation (CPE) system used by the Department of Defense. The "memory" will store, in a central data bank, contractor performance data for the use of Source Selection Boards. The purpose of this system is to improve efforts within management of defense research and development. It serves as a prime communication vehicle between contractors and customer agencies

487

MANAGEMENT SCIENCE IN THE WORLD OF TODAY AND TOMORROW

George B Dantzig

Management Science, vol 13, Feb 1967, p C-107 to C-111
Contracts No Nonr-222(83), No Nonr-3656(02), NSF Grant
No GP-2633

Discussion of the trend toward automation of simple human control tasks. Operations Research or Management Science has brought along a computer revolution in which nearly all tasks of man, whether manual, simple control, pattern recognition, or complex higher-order decision-making, are being reduced to mathematical terms and their solutions delegated to computers. Considering the rate at which this revolution is moving, it is questioned whether the government, industries, research centers, universities, and professional societies are moving ahead fast enough to prepare us for this new world

488

OPTIMIZATION PROBLEMS AND METHODS

John S deCam

IN OPERATIONS RESEARCH AND THE DESIGN OF MANAGEMENT INFORMATION SYSTEMS

Edited by J F Pierce, Jr

New York, Technical Association of the Pulp and Paper Industry, 1967, p 1-59 10 refs

Demonstration of how some types of optimization problems are approached and solved. Optimization problems are really problems in applied economics. Considering that economics has been defined as the study of the ways in which man allocates scarce means to satisfy competing ends, optimization problems and their solutions should have meaning in that context. Some techniques are discussed to meet this "end" - translating "means" and "end" into mathematics, obtaining the solution, and translating the solution back into the language of context in which the problem originally arose is the objective

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489

A NEW DIMENSION FOR CASH FLOW ANALYSIS

Lloyd D Doney

Management Services, May-June 1967, p 13-19

Discussion of a "second dimension" of cash flow analysis - the effect of varying levels of activity on the consequences of each decision. The usual cash flow analysis may be regarded as being one-dimensional, a serious flaw which severely limits its usefulness as a guide to management decisions. A new analytical tool, the Bayesian analysis, refers to a set of techniques that enables the decision-maker to cope systematically with uncertainty in business situations. In the sense that it provides a realistic method of dealing with uncertainties surrounding every cash flow projection, the Bayesian extension may be considered to have added a new dimension to decision making.

490

TIME SHARING, MANAGEMENT, AND MANAGEMENT SCIENCE

G J Feeney

Management Science, vol 13, Feb 1967, p C-112 to C-116

Impact of time-sharing systems on management practices (sales forecasting techniques, financial analysis, etc.). Under time-sharing, the computer is a personal tool available and responsive when it is needed. The implications for management and management science are enormous, since it provides a communication network as well as a computation capability. When the cost of time sharing gets down to \$2 or \$3 an hour, time-shared computing will become the central technology of all administrative activities.

491

THE ANALYSIS OF SIMULATION-GENERATED TIME SERIES

George S Fishman and Philip J Kiviat

Management Science, vol 13, Mar 1967, p 525, 526

Application of a statistical method, spectral analysis, to the study of time series data generated by simulated stochastic models. Mathematical models known as covariance stationary stochastic processes are useful representations of autocorrelated time series. This estimation procedure provides a tool for comparing simulated time series with real-world data and for understanding the implications that various alternative assumptions have on the output of simulated stochastic models.

492

USE OF CPM IN SYSTEMS INSTALLATIONS

Granville R Gargiulo

Management Services, May-June 1967, p 30-38

Consideration of using the critical path method (CPM) and the program evaluation and review technique (PERT) in circumstances other than R&D management and construction scheduling, their best-known applications. They are also suitable for control of systems projects. Some criteria are presented for deciding when a systems project would benefit from network analysis, and the method is illustrated by means of a simplified case study of the use of CPM to plan and control a computer-based information system installation.

493

TECHNICAL CHARACTERISTICS OF DISTRIBUTION SIMULATORS

Martin L Gerson and Richard B Maffei

Management Science, vol 10, Oct 1963, p 62-69

Comparison of the technical characteristics of a procedure to simulate a national distribution system with linear programming techniques now used in such analyses. Two case studies are presented for which simulation programs, comprising over 10,000 machine language instructions each, were designed to reduce operat-

ing capacity of the computer. The programs were found to be a valuable tool in studying the operating and cost-generating characteristics of the factory-warehouse-customer network.

494

EVALUATING TIME-SHARED COMPUTER USAGE

Michael M Gold

Massachusetts Institute of Technology, Alfred P Sloan School of Management, Working Paper No 198-66, May 1966 33 p 49 refs Contract No Nonr-4102(01)

Results of a research study conducted to evaluate time-sharing computer systems against batch-processing applications. The results support the major hypothesis that the user of a time-sharing system will demonstrate a higher level of performance than will the user of a more traditional system. This difference results from the characteristics of each computer system, which affect the user's attitudes toward the system.

495

COMPUTERS AND THE WORLD OF THE FUTURE

Edited by Martin Greenberger

Cambridge, Mass., M I T Press, 1962 340 p

This book discusses the nature of computers and present and future possibilities for applying them to various activities. Topics covered include scientists and decision-making in governments, decision-making in compartmented managements, simulation of human thinking, future library systems, the uses of computers in universities, time-sharing computer systems, and computer programming.

496

LARGE-SCALE LINEAR PROGRAMS THEORY AND COMPUTATION

Eli Hellerman

IN OPERATIONS RESEARCH AND THE DESIGN OF MANAGEMENT INFORMATION SYSTEMS

Edited by J F Pierce, Jr

New York, Technical Association of the Pulp and Paper Industry, 1967, p 60-75

Study of decomposition, a method for solving linear programming problems. Linear programming has found practical applications in a growing list of industries such as gasoline blending, transportation, manpower smoothing, production planning, inventory control, etc. In spite of advances in computers and solution techniques, larger problems still need solution. To solve these larger problems, the decomposition algorithm has been introduced, wherein the main problem breaks up into separate subproblems. The two distinct aspects to the basic theory of decomposition are (1) the way the subproblems influence a "master problem" and (2) the way the master problem influences the subproblem. The decomposition principle cannot, however, avoid the necessity for careful model building and careful preliminary analysis of a problem.

497

A GENERALIZED MODEL FOR ANALYZING MANAGEMENT INFORMATION SYSTEMS

Eugene D Homer

Management Science, vol 8, July 1962, p 500-515 5 refs

Discussion of a generalized model for analyzing management information systems. It is pointed out that, in spite of the potential power of the Lieberman model for integrated business systems, its application to practical cases is hampered by the fact that most systems can be described only in a series of matrices which are not compatible for multiplications.

S7 IMPACT ON MANAGEMENT

498

MNEMONICS

Michael Jackson

Datamation, Apr 1967, p 26, 27

Description of a new technique for automatic recognition by computer of abbreviated names - mnemonics. That part of the mnemonics package which handles the identification of company names is discussed, chiefly on the basis of the experimental and demonstration version of the system implemented on the 1440

Description of the use of RAPS, a Risk Appraisal of Programs System developed by the General Electric Co., in planning a program and managing the risks involved. Two major factors affecting the risk of failure in a development problem are resource limitations, such as funds and time, and the use of various management practices. Low-risk practices and the key areas where they apply and where most deficiencies are encountered are listed. In implementing RAPS, an initial appraisal determines all acceptable risk levels. The importance of considering all risks is noted, and some of the benefits derived are mentioned.

499

THE ABC'S OF THE CRITICAL PATH METHOD

F K Levy, G L Thompson, and J D Wiest

Harvard Business Review, vol. 41, Sept -Oct 1963, p 98-108

6 refs

Discussion of the critical path method (CPM), recently added to the growing assortment of quantitative tools for business decision making. Because of such characteristics as intuitive logic and graphic appeal, CPM finds wide appreciation at all levels of management.

504

THE SPEED OF RESPONSE OF FIRMS TO NEW TECHNIQUES

Edwin Mansfield

Quarterly Journal of Economics, vol. 77, May 1963, p 290-311

Study of factors influencing the speed with which a firm will begin using a new technique or innovation, with a model for predicting response time. It is established empirically that the time depends inversely on the size of the firm, the returns to be obtained, and the profitability or rate of return. The effects of a concentration of technical leadership and the time interval between innovations are also studied. It was found that the growth rate and profitability of a firm, the age of its president, and the profit trend have no significant effects.

500

A MATHEMATICAL MODEL FOR INTEGRATED BUSINESS SYSTEMS

Irving J Lieberman

Institute of Management Sciences, National Meeting, 2nd,

New York, N Y, Oct 20, 21, 1955, Paper 10 p

Proposal of a mathematical model for investigating integrated business systems, based on the notion of matrices. Elements of the matrices will determine the relationship between information and the communication of information, enabling the analyst to picture the whole of a very complicated situation in a relatively simplified form. The model allows for experimentation to determine the effects of certain suggested system changes without disturbing the actual system.

505

IDEATIONAL ITEMS - THE SYSTEMS CONCEPT

E W Martin, Jr.

Business Horizons, vol. 9, no 1, Spring 1966, p 63, 64

Consideration of the application of the systems concept to organizational R&D problems. The systems approach is particularly recommended because of its emphasis on relationships and the effects of relationships on the overall performance of a system. Subsystem characteristics and management responsibilities with regard to solving problems in large, complex systems are discussed. At present, the only hopeful technique is system simulation, which combines a systems viewpoint, a model building approach, and the utilization of powerful computers.

501

CONTINUOUS CHECK MADE ON ENGINES

Tania Long

New York Times, June 21, 1967

Description of a revolutionary engine maintenance technique introduced by American Airlines, which is based on the use of computers and electronic monitoring devices. The new concept - called "monitored maintenance" - is credited by the airline with savings of millions of dollars and a sharp increase in productivity.

506

USING SIMULATION TO DESIGN A MANAGEMENT INFORMATION SYSTEM

Adolph F. Moravec

Management Services, May-June 1966, p 50-58

Description of the use of model simulation to design a management information system for project planning and control and decision-making. This technique avoids the cost and confusion of experimenting with real facilities and the complications of formal mathematical analysis. The first step in constructing a simulation model is to determine the data processing philosophy of management and the objectives of the information system. After the condition elements are decided, the model is defined by network flow diagrams. It is important to consider the changing information needs of a firm in designing its information system. A defense project is given as an example.

502

HOW TO PLAN AND CONTROL WITH PERT

Robert W Miller

Harvard Business Review, vol 40 Mar -Apr 1962, p 93-104

Discussion of the use of program evaluation and review techniques (PERT) and the critical path method (CPM) in planning and controlling a program of development and production. The requirements of PERT are a sequenced network of events and activities and time estimates for each activity. With CPM the critical path and slack times for the network can be determined. Interdependencies and problem areas are revealed which are not always so obvious when using conventional planning methods. The cost of implementing PERT and some of the problems in attempting to use it are noted. Time-cost data are discussed.

507

THE IMPACT OF COMPUTERS ON MANAGEMENT

Edited by C A Myers

Cambridge, Mass., M I T Press, 1967 310 p

These collected research papers discuss, from various disciplinary angles, the present and future impacts of computers on management organization and the nature of managerial work. Although the main research papers were written around a central theme, they do not cover the same ground or reach similar conclusions. The relationships between man and machine and the role of both in industrial organizations are covered completely. The centralization of organization structures, managerial decision-making, and the importance of outside influence on organizational changes are discussed.

503

MANAGING RISKS FOR MORE EFFECTIVE PROGRAM CONTROL

Aerospace Management, vol 1, no 1, Spring 1966, p 17-24

S7 IMPACT ON MANAGEMENT

508

NEW WAY TO SPOT COMPANY TROUBLES

Business Week, Nov 4, 1961, p 158-161

Discussion of the application of the industrial dynamics technique by the Sprague Electric Co to its management problems. The technique is based on a systems engineering analysis of the flow of orders, materials, manpower, capital equipment, money, and information through a company. A mathematical model is constructed, based on a large number of equations, relating the flows of the quantities in a flow diagram and incorporating time delays and the level and rate of change of the level of a quantity at every point in the diagram.

509

ON THE ROAD TO TOTAL MANAGEMENT

Chemical Week, May 25, 1963, p 167-172

Description of the use of a total systems approach in the scientific management of a company. Using a technique called START, production, the decision network, and the information network are probed. Next, using a technique known as TAS-PAC, the relationships for marketing, manufacturing, and procurement are analyzed. On the basis of MAP, which was refined from the critical path method, resources were allocated according to priority in a way which uses minimum resources. Total management systems problem-solving can be effective with or without the use of computers.

510

BASIC NETWORKS CAN MAKE OR BREAK YOUR SYSTEM

Thomas V Sobczak

Aerospace Management, May 1962, p 24-26

Outline of the use of networks in critical path planning. The five basic steps in building a network are (1) selecting the end objectives and the baseline or starting point, (2) defining the events which will be used for time-estimating purposes, (3) laying out the network, (4) numbering the network, and (5) reviewing and authenticating the network layout. The layout represents a logical flow of occurrences from start to completion. Event definition is considered to be the most important of the steps. An example illustrates the procedure.

511

PERT & CPM PROVEN TOOLS FOR MANAGEMENT PLANNING AND CONTROL

Detroit, Burroughs Corp (Management Science Series), n d 40 p 117 refs

Study of the program evaluation and review technique (PERT) and the critical path method (CPM) of network analysis. Management of complex projects requires different tools and techniques such as PERT and CPM, which were developed to provide management control over the complexity and uncertainty characteristic of such projects. PERT and CPM are essentially similar approaches. Each requires that the activities involved in a project be defined in terms of their individual time requirements and their relationship with other activities, so that the project can be described in terms of a network. The computational capacity of a computer is required for all but the smallest networks, and the degree of sophistication of network analysis is largely dependent upon the size of the computer available.

512

SYSTEMS ANALYSIS TECHNIQUES FOR PLANNING-PROGRAMMING-BUDGETING

E S Quade

RAND Corp, Paper P-3322, Mar 1966 31 p 17 refs

Discussion of the use of systems analysis techniques in making decisions in the planning, programming, and budgeting process. Systems analysis is especially applicable to complex problems possessing uncertainties. The essence of the method is a model for comparing alternative courses of action in terms of cost effectiveness. Other major elements in the analysis are objectives, alternatives, costs, and criteria for ranking alternatives. The principles of good analysis and some important aspects of the models are reviewed, and some limitations of systems analysis are pointed out.

513

A SYSTEMS METHODOLOGY FOR EVALUATING INDUSTRIAL PROJECTS IN THE CONTEXT OF NATIONAL STRATEGIES

Edward B Roberts

United Nations Centre for Industrial Development, Symposium on Industrial Project Evolution, Prague, Czechoslovakia, Oct 1965, Paper 34 p 6 refs

Proposal of systems analysis methodology for evaluating industrial projects in the context of national strategies and capabilities. Eight serious faults in current, typical, simplistic evaluation methods are detailed. The proposed method is based on the life cycle of an industrial project. Two important uncontrollable factors are the potential, or changing, project value and project cost; however, more important are three controllable activities which can be affected by project evaluation and response. These are implementation, involving technical and managerial capability, financial organization for providing monetary resources, and sponsorship. The system is based on responses to changing values and costs, and the resulting activities and relationships are discussed. The principal industrial, economic, political, and socio-logical causes and effects, time delays between causes and effects, and information flow, or feedback, are three major aspects of the project life cycle model constructed. The particular methodology used is Industrial Dynamics. The system model avoids previous faults and is applicable to the evaluation of large industrial complexes in order to determine the impact on their environment and various aspects of society. The evaluation of proposed water resource programs in the Susquehanna River Basin is noted as an example. A model is sketched for the impact of a steel mill or petrochemical complex on the growth of a region.

514

THE EFFECTS OF PERT ON R&D ORGANIZATIONS

Wyckham D Seelig and Irwin M Rubin

Massachusetts Institute of Technology, Alfred P Sloan School of Management, Working Paper No. 230-66, Dec 1966 18 p 7 refs

Results of study of the effects of program evaluation and review technique (PERT) on project management in large R&D organizations. It was found that cost and schedule performance and communication were improved, and the authority structure was changed. Technical performance was unaffected.

515

SIMULATION

Detroit, Burroughs Corp (Management Science Series), n d 58 p 275 refs

Discussion of the use of models to simulate reality, a part of the scientific process used extensively in the physical sciences. The abstraction concept is explained, and the technique of simulation for management systems is detailed. Six characteristics of systems - goals, multiple resources, complex interactions, uncertainty and risk, information needs, and system interaction - are discussed.

516

MODELLING STRATEGIES FOR CORPORATE GROWTH

Robert S Spencer

American Association for the Advancement of Science, Conference, General Systems Research Session, Washington, D C, Dec 26, 1966, Paper 27 p

Study, using an industrial dynamics model of a self-contained division of the Dow Chemical Co., of the effects of various factors on the rates of growth of sales and profits. The marketing and R&D sectors are given the greatest consideration. Also discussed are the results of certain policy changes, the effects of monolithic or decentralized organizational styles, and synergistic effects.

517

ELECTRONIC BUSINESS SYSTEMS - NINETEEN EIGHTY-FOUR
Richard E. Sprague

Business Automation, Feb 1966, p 39, 40, 45-47.

Predictions concerning electronic business systems of the mid-1980s. Today, on-line, real-time computers are already in use. The time-sharing computer systems being contemplated will give rise to Information Utilities and a partnership of man and machine in handling information. Possible applications include a Credit and Money Utility. In matters of company management advanced business systems are used. In these systems, analysis and simulation of various alternatives are used to make decisions. Accounting structures will change for management planning, reporting, and cost measurement, and the organizations will reorient toward a structure where various managers will communicate with a central information service group possessing most of the responsibility for managing and planning changes.

518

THE SYSTEMS APPROACH - A UNIFIED CONCEPT OF PLANNING.
P. G. Thome and R. G. Willard

Aerospace Management, vol. 1, no. 3, Fall/Winter 1966, p 25-44.

Consideration of the systems approach as a unified concept of planning for large, complex problems involving hardware, technologies, facilities, and personnel. Systems analysis uses progressively finer analysis. After objectives are determined, they are analyzed to derive requirements and approaches. Selections are made on the basis of these criteria, and then they are synthesized into an advanced development plan or system design. The structure of the systems approach is examined, and the decision-making cycles, which each contain the aforementioned steps, are outlined. Systems approach principles are illustrated in detail by their application to the planning procedure problem for the technologies of a planetary exploration system.

519

MODELING AND STRATEGIC PLANNING

Seymour Tilles

Institute of Management Sciences, American Meeting, Boston, Mass., Apr 6, 1967, Paper 12 p

Discussion of the use of models in strategic planning in companies. Several models are recommended. With regard to modeling the corporate environment, dynamic models are needed for the demand and the competitive system of the firm. The model of a company itself should also be dynamic. An interaction model of the company and its environment requires feedback, knowledge about lead, lag and response times, and an ability to engage in experimental behavior. Models of the interaction between managers and the company can aid the effectiveness of other models. The importance of the model builder is noted.

520

A HEURISTIC MODEL FOR SCHEDULING LARGE PROJECTS WITH LIMITED RESOURCES

Jerome D. Wiest

Management Science, vol. 13, Feb 1967, p B-359 to B-377

27 refs.

Description of a heuristic approach for scheduling large projects with limited resources. Program evaluation and review technique (PERT) scheduling models implicitly assume unlimited availability of resources. The approach is based on a computer model capable of scheduling single or multiple projects within resource limits and other constraints. An advantage of this model is that, by changing certain parameters and heuristics in the model, project scheduling under varying constraints and scheduling rules can be simulated.

S8 PRACTICAL APPLICATIONS

521

SYSTEMS CAN TOO BE PRACTICAL

Allan Harvey

Business Horizons, Summer 1964, p 59-69

Outline of some of the problems in applying the systems approach to businesses and companies. It is noted that solutions must be practical, effective, and profitable. Also, it is noticed, it is not necessary to take into account every contingency, and real-life limitations and both long-term and short-term variables can be incorporated. Some particular failed systems are analyzed, and, finally, four benefits which can be derived from systems analysis are presented.

S9 BIBLIOGRAPHIES

522

PHYSICAL DISTRIBUTION MANAGEMENT SELECTED REFERENCES

American Management Association, Purchasing Div Course No. 11502, New York, N.Y., June 26-30, 1967 5 p

Selected references from the field of physical distribution management. Forty-nine references are given, including books and American Management Association and other publications. Eighteen of the references are annotated.

523

COMPLETE LISTING OF INDUSTRIAL DYNAMICS THESES

Massachusetts Institute of Technology, Alfred P. Sloan School of Management, Industrial Dynamics Course No. D-957, n.d. 7 p

Bibliography of theses written since the beginning of Industrial Dynamics research at the Alfred P. Sloan School of Management at MIT. The theses are classified according to degree: 29 for baccalaureate degrees, 66 for master of science, and six doctoral dissertations. Such subjects as workload fluctuations, mass production, and behavioral systems are included.

524

MANAGEMENT INFORMATION CONTROL SYSTEMS BIBLIOGRAPHY OF BOOKS

New York, Booz, Allen and Hamilton, Inc., 1966 2 p

Bibliography covering management information control systems. Operational research, systems analysis, and decision-making are covered in the list of 13 references.

525

REFERENCE LIST FEEDBACK SYSTEMS VIEWS OF R&D PROCESSES

Edward B. Roberts

Massachusetts Institute of Technology, Management of Research and Development No 15 384, Feb 23, 1967 2 p

Bibliography on management of R&D processes and related areas, covering system development, dynamic analysis, product development, technological forecasting, etc. Twenty books, theses, and working papers are included.

526

A KWIC INDEX AND BIBLIOGRAPHY OF OPERATIONS RESEARCH AND RELATED TOPICS IN THE PULP AND PAPER INDUSTRY

Edited by J. F. Pierce

New York, Technical Association of the Pulp and Paper Industry (CA Report No. 9), 1966 151 p

A KWIC (Keyword-in-Context) index and bibliography of operations research and related topics in the pulp and paper industry, covering computer methods, forest planning, quality control, etc. Abstracts from the Abstract Bulletin of the Institute of Paper Chemistry, Forestry Abstracts, and International Abstracts in Operations Research are given.

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MANAGEMENT / *the systems approach*

JULY 1969

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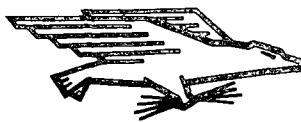
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